(2)

IDA PAPER P-1851

ANALYSIS OF WARTIME CONSUMPTION RATES FOR CHEMICAL DEFENSIVE EQUIPMENT

Volume II: Appendices A, B, and C DOCUMENTATION

Willard M. Christenson
Edward P. Kerlin

May 1986

Prepared for
Assistant Secretary of Defense for Acquisition and Logistics

INSTITUTE FOR DEFENSE ANALYSES
1801 N. Beauregard Street, Alexandria, Virginia 22311

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE

AD-A173929

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY DD Form 254, MDA 903-84-C-0084, OUSDRE (DOD-IDA Management Office), 1 October 1983	3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution unlimited
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE N/A	
4. PERFORMING ORGANIZATION REPORT NUMBER(S) IDA Paper P-1851	5. MONITORING ORGANIZATION REPORT NUMBER (S)
6a. NAME OF PERFORMING ORGANIZATION Institute for Defense Analyses 6b. OFFICE SYMBOL (If applicable)	7a. NAME OF MONITORING ORGANIZATION OSD, OUSDRE, DoD-IDA Management Office
6c. ADDRESS (CITY, STATE, AND ZIP CODE) 1801 North Beauregard Street Alexandria, Virginia 22311	7b. ADDRESS (CITY, STATE, AND ZIP CODE) 1801 North Beauregard Street Alexandria, Virginia 22311
8a. NAME OF FUNDING/SPONSORING ORGANIZATION Assistant Secretary of Defense Acquisition and Logistics 8b. OFFICE SYMBOL	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER MDA 903 84 C 0084
8c. ADDRESS (City, State, and Zip Code) The Pentagon Washington, DC 20301	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. / PROJECT NO. / TASK NO. T-L6-245 / ACCESSION NO. / WORK UNIT

11. TITLE (Include Security Classification)
ANALYSIS OF WARTIME CONSUMPTION RATES FOR CHEMICAL DEFENSIVE EQUIPMENT
Volume II: Appendices A, B, and C, DOCUMENTATION

12. PERSONAL AUTHOR(S)
Willard M. Christenson, Edward P. Kerlin

13. TYPE OF REPORT	13b. TIME COVERED FROM TO	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Contributing Analysis		May 1986	131

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	chemical defensive equipment, wartime consumption rates, chemical warfare, TACWAR model, functional support units, notional units; post-processor

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

The objective of the analysis was to provide a comprehensive evaluation of wartime consumption rates for chemical warfare (CW) defensive material for use in developing War Reserve requirements and assessing the current US stockpile. The study presents, in Volume I, a comprehensive discussion of the efforts undertaken to compute the wartime consumption rates for chemical warfare defensive equipment (CDE) using the IDA TACWAR model. Volume II, Documentation, comprises Appendices A, B and C. Appendix A details how division, corps and theater army support forces were aggregated to provide functional support units as input to the TACWAR model. Appendix B contains a discussion of the decision rules that were developed by the U.S. Army Chemical School for use in the analysis. Appendix C presents the details of the post-processor which was developed to manipulate output data from the TACWAR model and generates consumption rates for each CDE item. Appendix D, which is presented as Volume III, contains the actual consumption rates for the CDE items which form the detailed output of this study.

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION
☐ UNCLASSIFIED/UNLIMITED ☒ SAME AS REPORT ☐ DTIC USERS	UNCLASSIFIED
22a. NAME OF RESPONSIBLE INDIVIDUAL	22b. TELEPHONE (Include Area Code) / 22c. OFFICE SYMBOL

DD FORM 1473, 84 MAR

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE

IDA PAPER P-1851

ANALYSIS OF WARTIME CONSUMPTION RATES FOR CHEMICAL DEFENSIVE EQUIPMENT

Volume II: Appendices A, B, and C DOCUMENTATION

Willard M. Christenson
Edward P. Kerlin

May 1986

A-1

INSTITUTE FOR DEFENSE ANALYSES

Contract MDA 903 84 C 0031
Task T-L6-245

PREFACE

This report on the Analysis of Wartime Consumption Rates for Chemical Defensive Equipment is a product of research by the Institute for Defense Analyses for the Assistant Secretary of Defense, Acquisition and Logistics (A&L) and for the U.S. Army Deputy Chief of Staff for Logistics (DCSLOG). The work for this task was performed under contract MDA 903 84C 0031: T-L6-245, as amended. This study is issued in fulfillment of the contract.

The objective of the analysis, as stated in the Task Order, was to provide a comprehensive evaluation of wartime consumption rates for chemical warfare (CW) defensive materiel for use in developing War Reserve requirements and assessing the current U.S. stockpile. The objective of the task was met and is documented in this report.

A comprehensive discussion of the efforts undertaken to compute the wartime consumption rates for chemical warfare defensive equipment (CDE) using the IDA TACWAR model is presented as Volume I, Main Report. Volume II, Documentation, comprises Appendices A, B and C. Appendix A details how division, corps and theater army support forces were aggregated to provide functional support units as input to the TACWAR model. Appendix B contains a discussion of the decision rules that were developed by the U.S. Army Chemical School for use in the analysis. Appendix C presents the details of the post-processor which was developed to manipulate output data from the TACWAR model and generate the consumption rates for each CDE item. Appendix D, which is presented as Volume III, contains the actual consumption rates for the CDE items which form the detailed output of this study.

Appendix A

CORPS AND THEATER LEVEL SIMULATION SUPPORT UNITS DATA

Appendix A

CORPS AND THEATER LEVEL SIMULATION SUPPORT UNITS DATA

The tables presented in this Appendix contain data pertaining to the corps and theater level simulation support units (Higher Echelon Units), and the major combat Units (Major Units), showing the values used in the TACWAR model and the Wartime Replacement Factor Post Processor for the various personnel and equipment strengths used in this study, except for weapons data reflected elsewhere. It should be noted that these values are aggregates based on the actual strengths and equipment densities reflected in applicable Tables of Organization and Equipment (TOE).

Aggregation for US forces, Higher Echelon simulation units, was carried out according to the rules stated in Chapter III, with separate values computed for V and VII Corps and Theater Army. Values for NATO Higher Echelon simulation units were established using Troop Strength and Combat Unit US/non-US NATO ratios. Higher Echelon unit structures and values for Warsaw Pact/Soviet forces were based on similar ratios, as modified by our current knowledge of Warsaw Pact support structures. Greater detail for non-US NATO and Warsaw Pact Higher Echelon unit simulation is beyond the scope of this study.

Aggregation for Combat Units was performed according to the rules and conventions normally used with the TACWAR model. Hence, in Tables A-1 through A-7, one finds four different types of Army Divisions, an Armored Cavalry Regiment, and two separate Brigades. Each of these major units is represented according to the simulation sub-units into which it is divided in TACWAR for modeling purposes. All units within a particular Major Unit which do not correspond with the types of sub-units shown have been aggregated with one of the seven sub-unit types for representation in the model and Post Processor. Additionally, it should be noted that Corps/Theater Army combat support units, except Engineers, are aggregated with the Major Units. Therefore, the strengths shown are aggregates of TOE values, not the TOE values themselves.

Table A-1. (U) ARMORED DIVISION, 6 TANK/4 MECHANIZED BATTALIONS

SUB-UNIT	ARM CO	MECH CO	CAV TRP	ARTY BY	HQ SM	HQ LGE	SPT CO	DIV TOTAL
DENSITY	18.0	12.0	6.0	23.0	21.0	6.0	25.0	
PERSONNEL	105.1	264.5	147.3	170.8	203.6	178.3	187.8	
TOT PER	1892.0	3174.0	884.0	3929.0	4274.7	1069.7	4695.0	19918.4
TRUCKS	5.4	12.7	17.7	21.3	44.4	39.8	40.9	
TOT TRK	98.0	152.0	106.0	488.9	933.0	239.0	1022.0	3038.9
LIST A	22.9	17.5	.3	2.5	9.2	4.6	3.4	
TOT LA	412.0	210.0	2.0	57.0	193.3	27.3	85.0	986.7
LIST B	27.7	131.7	41.7	81.2	100.4	87.5	89.2	
TOT LB	498.0	1580.0	250.0	1868.1	2108.0	525.0	2230.0	9059.1
M17 MASK	13.0	102.5	88.3	118.0	172.6	151.8	169.1	
TOT M17	234.0	1230.0	530.0	2714.2	3624.7	910.7	4228.0	13471.5
M24 MASK	.0	.0	59.3	.0	1.1	1.3	8.8	
TOT M24	.0	.0	356.0	.0	23.0	8.0	220.0	607.0
M25 MASK	86.1	162.0	.0	39.9	38.5	23.9	8.1	
TOT M25	1550.0	1944.0	.0	917.5	807.7	143.7	203.0	5565.8
M1 TANK	19.7	.0	.0	.0	.9	.0	.0	
TOT M1	354.0	.0	.0	.0	18.0	.0	.0	372.0
BRAD IFV	.0	13.0	.0	.0	.4	.0	.0	
TOT BIF	.0	156.0	.0	.0	8.0	.0	.0	164.0
SGT YORK	.0	.0	.0	.3	.4	1.3	.0	
TOT SGT	.0	.0	.0	8.0	8.0	8.0	.0	24.0
SPEC ITEMS	20.8	15.8	.0	1.7	2.6	1.1	.6	
TOT SP	374.0	190.0	.0	39.7	55.3	6.3	15.0	680.4
VEHICLES	30.0	50.5	17.7	34.3	56.5	45.9	43.4	
TOT VEH	540.0	606.0	106.0	788.2	1187.3	275.3	1085.0	4587.9

Table A-2. (U) MECHANIZED DIVISION, 6 MECHANIZED/4 TANK BATTALIONS

SUB-UNIT	ARM CO	MECH CO	CAV TRP	ARTY BY	HQ SM	HQ LGE	SPT CO	DIV TOTAL
DENSITY	12.0	18.0	6.0	23.0	21.0	6.0	25.0	
PERSONNEL	113.7	240.9	147.3	170.8	205.7	178.3	187.8	
TOT PER	1364.0	4336.0	884.0	3929.0	4320.7	1069.7	4695.0	20598.4
TRUCKS	5.7	10.4	17.7	21.3	43.8	39.8	40.9	
TOT TRK	68.0	188.0	106.0	488.9	919.0	239.0	1022.0	3030.9
LIST A	24.8	15.0	.3	2.5	9.1	4.6	3.4	
TOT LA	298.0	270.0	2.0	57.0	191.3	27.3	85.0	930.7
LIST B	31.0	117.8	41.7	81.2	102.2	87.5	89.2	
TOT LB	372.0	2120.0	250.0	1868.1	2147.0	525.0	2230.0	9512.1
M17 MASK	14.5	104.4	88.3	118.0	173.6	151.8	169.1	
TOT M17	174.0	1880.0	530.0	2714.2	3644.7	910.7	4228.0	14081.5
M24 MASK	.0	.0	59.3	.0	1.1	1.3	8.8	
TOT M24	.0	0	356.0	.0	23.0	8.0	220.0	607.0
M25 MASK	93.2	146.4	.0	39.9	39.7	23.9	8.1	
TOT M25	1118.0	2636.0	.0	917.5	833.7	143.7	203.0	5851.8
M1 TANK	21.0	.0	.0	.0	.6	.0	.0	
TOT M1	252.0	.0	.0	.0	12.0	.0	.0	264.0
BRAD IFV	.0	13.0	.0	.0	.6	.0	.0	
TOT BIF	.0	234.0	.0	.0	12.0	.0	.0	246.0
SGT YORK	.0	.0	.0	.3	.4	1.3	.0	
TOT SGT	.0	.0	.0	8.0	8.0	8.0	.0	24.0
SPEC ITEMS	22.2	15.0	.0	1.7	2.5	1.1	.6	
TOT SP	266.0	270.0	.0	39.7	53.3	6.3	15.0	650.4
VEHICLES	33.0	45.4	17.7	34.3	56.2	46.1	43.8	
TOT VEH	396.0	810.0	106.0	789.5	1180.7	376.7	1094.0	4660.9

Table A-3. (U) MECHANIZED DIVISION, 5 MECHANIZED/5 TANK BATTALIONS

SUB-UNIT	ARM CO	MECH CO	CAV TRP	ARTY BY	HQ SM	HQ LGE	SPT CO	DIV TOTAL
DENSITY	15.0	15.0	12.0	20.0	23.0	6.0	30.0	
PERSONNEL	126.1	211.6	73.7	196.5	185.9	178.3	156.5	
TOT PER	1892.0	3174.0	884.0	3929.0	4274.7	1069.7	4695.0	19918.4
TRUCKS	6.5	10.1	8.8	24.4	40.5	39.8	34.1	
TOT TRK	98.0	152.0	106.0	488.9	933.0	239.0	1022.0	3038.9
LIST A	27.5	14.0	.2	2.9	8.4	4.6	2.8	
TOT LA	412.0	210.0	2.0	57.0	193.3	27.3	85.0	986.7
LIST B	33.2	105.3	20.8	93.4	91.7	87.5	74.3	
TOT LB	498.0	1580.0	250.0	1868.1	2108.0	525.0	2230.0	9059.1
M17 MASK	15.6	82.0	44.2	135.7	157.6	151.8	140.9	
TOT M17	234.0	1230.0	530.0	2714.2	3624.7	910.7	4228.0	13471.5
M24 MASK	.0	.0	29.7	.0	1.0	1.3	7.3	
TOT M24	.0	.0	356.0	.0	23.0	8.0	220.0	607.0
M25 MASK	103.3	129.6	.0	45.9	35.1	23.9	6.8	
TOT M25	1550.0	1944.0	.0	917.5	807.7	143.7	203.0	5565.8
M1 TANK	23.6	.0	.0	.0	.8	.0	.0	
TOT M1	354.0	.0	.0	.0	18.0	.0	.0	372.0
BRAD IFV	.0	10.4	.0	.0	.3	.0	.0	
TOT BIF	.0	156.0	.0	.0	8.0	.0	.0	164.0
SGT YORK	.0	.0	.0	.4	.3	1.3	.0	
TOT SGT	.0	.0	.0	8.0	8.0	8.0	.0	24.0
SPEC ITEMS	24.9	12.7	.0	1.9	2.4	1.1	.5	
TOT SP	374.0	190.0	.0	39.7	55.3	6.3	15.0	680.4
VEHICLES	36.0	40.4	8.8	39.4	51.6	45.9	36.2	
TOT VEH	540.0	606.0	106.0	788.2	1187.3	275.3	1085.0	4587.9

Table A-4. (U) ARMORED CAVALRY REGIMENT

SUB-UNIT	ARM CO	MECH CO	CAV TRP	ARTY BY	HQ SM	HQ LGE	SPT CO	DIV TOTAL
DENSITY	9.0	3.0	3.0	3.0	5.0	1.0	5.0	
PERSONNEL	114.0	241.0	147.0	171.7	206.0	180.0	180.0	
TOT PER	1026.0	723.0	441.0	515.0	1030.0	180.0	900.0	4815.0
TRUCKS	5.6	10.0	16.0	20.0	41.0	39.0	37.0	
TOT TRK	50.0	30.0	48.0	60.0	205.0	39.0	185.0	617.0
LIST A	19.4	11.7	.3	2.3	6.0	6.0	2.0	
TOT LA	175.0	35.0	1.0	7.0	30.0	6.0	10.0	264.0
LIST B	31.0	118.0	42.0	70.3	92.0	80.0	83.0	
TOT LB	279.0	354.0	126.0	211.0	460.0	80.0	415.0	1925.0
M17 MASK	25.6	104.0	94.7	121.3	174.0	152.0	169.0	
TOT M17	230.0	312.0	284.0	364.0	870.0	152.0	845.0	3057.0
M24 MASK	.0	.0	60.3	.0	2.0	4.0	9.0	
TOT M24	.0	.0	181.0	.0	10.0	4.0	45.0	240.0
M25 MASK	33.0	140.0	.0	36.7	28.0	21.0	5.0	
TOT M25	837.0	420.0	.0	110.0	140.0	21.0	25.0	1553.0
M1 TANK	16.0	.0	1.7	.0	.8	.0	.0	
TOT M1	144.0	.0	5.0	.0	4.0	.0	.0	153.0
BRAD IFV	.0	0	.0	.0	.0	.0	.0	
TOT BIF	.0	.0	.0	.0	.0	.0	.0	.0
SGT YORK	.0	.0	.0	.0	.0	.0	.0	
TOT SGT	.0	.0	.0	.0	.0	.0	.0	.0
SPEC ITEMS	18.0	15.0	.0	2.0	2.0	3.0	1.0	
TOT SP	162.0	45.0	.0	6.0	10.0	3.0	5.0	231.0
VEHICLES	24.2	30.0	17.7	35.0	66.0	55.0	38.4	
TOT VEH	218.0	90.0	53.0	105.0	330.0	55.0	192.0	1043.0

Table A-5. (U) INFANTRY BRIGADE, MECHANIZED

SUB-UNIT	ARM CO	MECH CO	CAV TRP	ARTY BY	HQ SM	HQ LGE	SPT CO	DIV TOTAL
DENSITY	3.0	6.0	2.0	4.0	5.0	1.0	5.0	
PERSONNEL	116.3	222.0	220.5	128.8	204.0	180.0	180.0	
TOT PER	349.0	1332.0	441.0	515.0	1020.0	180.0	900.0	4737.0
TRUCKS	7.7	8.7	24.0	15.0	41.0	39.0	37.0	
TOT TRK	23.0	52.0	48.0	60.0	205.0	39.0	185.0	612.0
LIST A	5.0	13.0	.5	1.8	6.0	6.0	4.0	
TOT LA	15.0	78.0	1.0	7.0	30.0	6.0	20.0	157.0
LIST B	37.7	106.7	63.0	52.8	92.0	80.0	83.0	
TOT LB	113.0	640.0	126.0	211.0	460.0	80.0	415.0	2045.0
M17 MASK	23.0	88.0	142.0	101.3	176.0	160.0	169.0	
TOT M17	69.0	528.0	284.0	405.0	880.0	160.0	845.0	3171.0
M24 MASK	.0	.0	40.5	.0	2.0	4.0	4.0	
TOT M24	.0	.0	81.0	.0	10.0	4.0	20.0	115.0
M25 MASK	93.3	134.0	47.5	27.5	28.4	23.0	11.0	
TOT M25	280.0	804.0	95.0	110.0	142.0	23.0	55.0	1509.0
M1 TANK	17.0	.0	2.5	.0	.8	.0	.0	
TOT M1	51.0	.0	5.0	.0	4.0	.0	.0	60.0
BRAD IFV	.0	13.0	.0	.0	.0	.0	.0	
TOT BIF	.0	78.0	.0	.0	.0	.0	.0	78.0
SGT YORK	.0	.0	.0	.0	.0	.0	.0	
TOT SGT	.0	.0	.0	.0	.0	.0	.0	.0
SPEC ITEMS	2.0	14.3	.0	1.5	2.0	3.0	1.4	
TOT SP	6.0	86.0	.0	6.0	10.0	3.0	7.0	118.0
VEHICLES	32.3	40.3	26.5	26.3	66.0	55.0	36.0	
TOT VEH	97.0	242.0	53.0	105.0	330.0	55.0	180.0	1062.0

Table A-6. (U) SEPARATE ARMORED BRIGADE

SUB-UNIT	ARM CO	MECH CO	CAV TRP	ARTY BY	HQ SM	HQ LGE	SPT CO	DIV TOTAL
DENSITY	6.0	3.0	2.0	4.0	5.0	1.0	5.0	
PERSONNEL	116.3	222.0	220.5	128.8	204.0	180.0	180.0	
TOT PER	698.0	666.0	441.0	515.0	1020.0	130.0	900.0	4420.0
TRUCKS	7.7	8.7	24.0	15.0	41.0	39.0	37.0	
TOT TRK	46.0	26.0	48.0	60.0	205.0	39.0	185.0	609.0
LIST A	5.0	13.0	.5	1.8	6.0	6.0	4.0	
TOT LA	30.0	39.0	1.0	7.0	30.0	6.0	20.0	133.0
LIST B	37.7	106.7	63.0	52.8	92.0	80.0	83.0	
TOT LB	226.0	320.0	126.0	211.0	460.0	80.0	415.0	1838.0
M17 MASK	23.0	88.0	142.0	101.3	176.0	160.0	169.0	
TOT M17	138.0	264.0	284.0	405.0	880.0	160.0	845.0	2976.0
M24 MASK	.0	.0	40.5	.0	2.0	4.0	4.0	
TOT M24	.0	.0	81.0	.0	10.0	4.0	20.0	115.0
M25 MASK	93.3	134.0	47.5	27.5	28.4	23.0	11.0	
TOT M25	560.0	402.0	95.0	110.0	142.0	23.0	55.0	1387.0
M1 TANK	17.0	.0	2.5	.0	.8	.0	.0	
TOT M1	102.0	.0	5.0	.0	4.0	.0	.(	111.0
BRAD IFV	.0	13.0	.0	.0	.0	.0	.0	
TOT BIF	.0	39.0	.0	.0	.0	.0	.0	39.0
SGT YORK	.0	.0	.0	.0	.0	.0	.0	
TOT SGT	.0	.0	.0	.0	.0	.0	.0	.0
SPEC ITEMS	3.0	14.3	.0	1.5	2.0	3.0	1.4	
TOT SP	12.0	43.0	.0	6.0	10.0	3.0	7.0	81.0
VEHICLES	32.3	40.3	26.5	26.3	66.0	55.0	36.0	
TOT VEH	194.0	121.0	53.0	105.0	330.0	55.0	180.0	1038.0

Table A-7. (U) LIGHT INFANTRY DIVISION

SUB-UNIT	ARM CO	INF CO	CAV TRP	ARTY BY	HQ SM	HQ LGE	SPT CO	DIV TOTAL
DENSITY	1.0	27.0	2.0	9.0	19.0	7.0	15.0	
PERSONNEL	.0	123.0	308.0	113.8	144.9	129.1	115.0	
TOT PER	.0	3321.0	616.0	1022.0	2753.0	904.0	1725.0	10341.0
TRUCKS	.0	8.9	36.0	23.1	30.5	44.2	30.7	
TOT TRK	.0	239.0	72.0	208.3	579.3	309.3	460.0	1868.0
LIST A	.0	.0	.0	.2	6.1	.3	2.2	
TOT LA	.0	.0	.0	2.0	115.0	2.0	33.0	152.0
LIST B	.0	32.7	171.0	66.5	69.2	79.8	65.3	
TOT LB	.0	884.0	342.0	598.3	1315.3	558.3	930.0	4678.0
M17 MASK	.0	123.0	220.0	110.2	342.1	119.1	113.1	
TOT M17	.0	3321.0	440.0	992.0	2699.0	834.0	1696.0	9982.0
M24 MASK	.0	.0	83.0	.0	.7	6.4	2.0	
TOT M24	.0	.0	166.0	.0	14.0	45.0	30.0	255.0
M25 MASK	.0	.0	.0	3.4	2.1	4.3	.3	
TOT M25	.0	.0	.0	30.3	40.3	30.3	5.0	106.0
M1 TANK	.0	.0	.0	.0	.0	.0	.0	
TOT M1	.0	.0	.0	.0	.0	.0	.0	.0
BRAD IFV	.0	.0	.0	.0	.0	.0	.0	
TOT BIF	.0	.0	.0	.0	.0	.0	.0	.0
SGT YORK	.0	.0	.0	.0	.0	.0	.0	
TOT SGT	.0	.0	.0	.0	.0	.0	.0	.0
SPEC ITEMS	.0	.0	.0	.1	1.9	.2	.5	
TOT SP	.0	.0	.0	1.3	36.3	1.3	7.0	46.0
VEHICLES	.0	8.3	36.0	23.4	30.6	44.5	32.1	
TOT VEH	.0	239.0	72.0	210.7	581.7	311.7	482.0	1897.0

Table A-8. (U) CORPS PLUG FOR LIGHT INFANTRY DIVISION

SUB-UNIT	ARM CO	MECH CO	CAV TRP	ARTY BY	HQ SM	HQ LGE	SPT CO	DIV TOTAL
DENSITY	3.0	3.0	3.0	3.0	3.0	1.0	2.0	
PERSONNEL	116.3	222.0	73.3	171.7	204.0	180.0	226.0	
TOT PER	349.0	666.0	220.0	515.0	612.0	180.0	452.0	2994.0
TRUCKS	7.7	8.7	8.0	20.0	47.0	39.0	41.0	
TOT TRK	23.0	26.0	24.0	60.0	141.0	39.0	82.0	395.0
LIST A	5.0	13.0	.3	2.3	6.7	6.0	6.5	
TOT LA	15.0	39.0	1.0	7.0	20.0	6.0	13.0	101.0
LIST B	37.7	106.7	21.0	70.3	105.3	80.0	107.0	
TOT LB	113.0	320.0	63.0	211.0	318.0	80.0	214.0	1317.0
M17 MASK	23.0	88.0	47.3	135.0	175.0	160.0	206.0	
TOT M17	69.0	264.0	142.0	405.0	525.0	160.0	412.0	1977.0
M24 MASK	.0	.0	13.7	.0	2.0	4.0	4.0	
TOT M24	.0	.0	41.0	.0	6.0	4.0	8.0	59.0
M25 MASK	93.3	134.0	15.7	36.7	27.7	23.0	23.0	
TOT M25	280.0	402.0	47.0	110.0	83.0	23.0	46.0	991.0
M1 TANK	17.0	.0	1.0	.0	1.3	.0	.0	
TOT M1	51.0	.0	3.0	.0	4.0	.0	.0	58.0
BRAD IFV	.0	13.0	.0	.0	.0	.0	.0	
TOT BIF	.0	39.0	.0	.0	.0	.0	.0	39.0
SGT YORK	.0	.0	.0	.0	.0	.0	.0	
TOT SGT	.0	.0	.0	.0	.0	.0	.0	.0
SPEC ITEMS	2.0	14.3	.0	2.0	2.3	3.0	2.5	
TOT SP	6.0	43.0	.0	6.0	7.0	3.0	5.0	70.0
VEHICLES	32.3	40.3	9.0	35.0	78.3	55.0	37.0	
TOT VEH	97.0	121.0	27.0	105.0	235.0	55.0	74.0	714.0

Table A-9. (U) INFANTRY DIVISION (LIGHT INFANTRY DIVISION WITH CORPS PLUG)

SUB-UNIT	ARM CO	INF CO	CAV TRP	ARTY BY	HQ SM	HQ LGE	SPT CO	DIV TOTAL
DENSITY	3.0	30.0	5.0	12.0	22.0	8.0	17.0	
PERSONNEL	116.3	132.9	167.2	128.1	152.9	135.5	128.0	
TOT PER	349.0	3987.0	836.0	1537.0	3365.0	1084.0	2177.0	13335.0
TRUCKS	7.7	8.8	19.2	22.4	32.7	43.5	31.9	
TOT TRK	23.0	265.0	96.0	268.3	720.3	348.3	542.0	2263.0
LIST A	5.0	1.3	.2	.8	6.1	1.0	2.7	
TOT LA	15.0	39.0	1.0	9.0	135.0	8.0	46.0	253.0
LIST B	37.7	40.1	81.0	67.4	74.2	79.8	70.2	
TOT LB	113.0	1204.0	405.0	809.3	1631.3	638.3	1194.0	5995.0
M17 MASK	23.0	119.5	116.4	118.4	146.5	124.3	124.0	
TOT M17	69.0	3585.0	582.0	1397.0	3224.0	994.0	2108.0	11959.0
M24 MASK	.0	.0	41.4	.0	.9	6.1	2.2	
TOT M24	.0	.0	207.0	.0	20.0	49.0	38.0	314.0
M25 MASK	93.3	13.4	9.4	11.7	5.6	6.7	3.0	
TOT M25	280.0	402.0	47.0	140.3	123.3	53.3	51.0	1097.0
M1 TANK	17.0	.0	.6	.0	.2	.0	.0	
TOT M1	51.0	.0	3.0	.0	4.0	.0	.0	58.0
BRAD IFV	.0	1.3	.0	.0	.0	.0	.0	
TOT BIF	.0	39.0	.0	.0	.0	.0	.0	39.0
SGT YORK	.0	.0	.0	.0	.0	.0	.0	
TOT SGT	.0	.0	.0	.0	.0	.0	.0	.0
SPEC ITEMS	2.0	1.4	1.2	.6	1.9	.5	.7	
TOT SP	6.0	43.0	6.0	7.3	43.3	4.3	12.0	122.0
VEHICLES	32.3	12.0	19.8	26.3	37.1	45.8	34.2	
TOT VEH	97.0	360.0	99.0	315.7	816.7	366.7	582.0	2637.0

Table A-10. (U) AVIATION SIMULATION UNIT

AVIATION SIMULATION UNIT		V CORPS	VII CORPS	THEA ARMY
SIM UNITS PER CORPS/TA		3.0	4.0	3.0
LIST A				
	ITEM PER SIM UNIT	.3	.8	1.3
	CORPS-TA TOTALS	1.0	3.0	4.0
LIST B				
	ITEM PER SIM UNIT	70.7	46.0	63.0
	CORPS-TA TOTALS	212.0	184.0	189.0
M17 MASK				
	ITEM PER SIM UNIT	154.0	98.8	165.0
	CORPS-TA TOTALS	462.0	395.0	495.0
M24 MASK				
	ITEM PER SIM UNIT	105.7	65.0	119.3
	CORPS-TA TOTALS	317.0	260.0	358.0
PERSONNEL				
	ITEM PER SIM UNIT	259.3	163.5	283.7
	CORPS-TA TOTALS	778.0	654.0	851.0
TRUCKS				
	ITEM PER SIM UNIT	24.7	18.5	23.0
	CORPS-TA TOTALS	74.0	74.0	69.0

(U) SIMULATION UNIT: AIR TRANSPORT UNIT

1. (U) Refs: A. TO&E 55167J100 (Med Helo Co)
B. TO&E 01137H100 (Theater Avn Co)
C. TO&E 01127H100 (Corps Avn Co)

2. (U) Capabilities:

a. (U) From Refs B. and C.: Aviation Company capabilities are stated as providing movement of high priority personnel. There is no need to attempt quantifying this capability at this time.

b. (U) From Ref A.: One day of Medium Helicopter Company capability assuming 75% availability of 24 CH-47C Medium Helicopters, is one of the following or some combination thereof:

One-Way Distance	Turn-Around (minutes)	Sorties	Troops Carried	Cargo (s/tons)	Ton-Km Capability
40 km (26.6 Nm)	34	66	2178	594	23,760
75 km (53.7 Nm)	62	36	1188	324	24,300
100 km (71.5 Nm)	86	26	856	234	23,400

d. (U) From the table above, the mean ton-km per day capability is 23,820. This is near the mid-range (23,850) and median (23,760) figures. The mean will be rounded to 23,800 ton-km and used as the basis for the simulation unit capability computation in the absence of other unit capabilities to be simulated.

3. (U) Aggregate SRCs:

NOMENCLATURE	SRC
Corps Avn Co	01127H100
Avn Co	01137H100
ATC Co	01227J700
Med Helo Co	55167J100
Med Helo Co	55167H700
HHC, Avn Bn	01256H200
HHD, ATC Bn	01226H700

Table A-11. (U) AMMUNITION (CONVENTIONAL) SIMULATION UNIT

AMMUNITION (CONVENTIONAL) SIMULATION UNIT		V CORPS	VII CORPS	THEA ARMY
SIM UNITS PER CORPS/TA		7.0	5.0	13.0
LIST A				
	ITEM PER SIM UNIT	1.7	1.2	1.7
	CORPS-TA TOTALS	12.0	6.0	22.0
LIST B				
	ITEM PER SIM UNIT	142.1	121.4	132.1
	CORPS-TA TOTALS	995.0	607.0	1717.0
M17 MASK				
	ITEM PER SIM UNIT	279.1	228.4	240.8
	CORPS-TA TOTALS	1954.0	1142.0	3130.0
PERSONNEL				
	ITEM PER SIM UNIT	279.7	229.4	241.2
	CORPS-TA TOTALS	1958.0	1147.0	3135.0
TRUCKS				
	ITEM PER SIM UNIT	54.7	44.0	52.3
	CORPS-TA TOTALS	383.0	220.0	680.0

(U) SIMULATION UNIT: CONVENTIONAL AMMO UNIT (ASP)

1. (U) Refs: A: FM 9-6, pp F-3, -4
B: FM 101-10-2

2. (U) Capabilities:

a. (U) Each DS Ord Co (Conv Ammo) is equipped to handle 2100 short tons of ammo per day, that is, both to receive and issue tonnages. Therefore, they issue .5 x 2100 = 1050 s/tons/day.

b. (U) Each DS Ord Co sets up 2 ASPs; therefore, each ASP handles approximately 525 s/tons in and out per day.

c. (U) On a surge basis, each ASP can handle 750 s/tons/day direct load off-load from stake and platform trucks.

d. (U) ASPs are located 45 to 60 kms behind FLOT.

e. (U) Turn-around time to and from an ASP is considered 4-1/2 hours, which includes 75 minutes at the ASP to process paper work.

f. (U) The capacity for our Simulation ASP will be 525 s/tons per day throughput.

3. (U) Aggregate SRCs:

NOMENCLATURE	SRC
Ord Co, Ammo Conv DS	09064H100
Ord Co, Conv GS	09074H100
HHD, Ammo Supply Bn	09066H100

Table A-12. (U) AMMUNITION (SPECIAL) SIMULATION UNIT

AMMUNITION (SPECIAL) SIMULATION UNIT		V CORPS	VII CORPS	THEA ARMY
SIM UNITS PER CORPS/TA		4.0	2.0	8.0
LIST A				
	ITEM PER SIM UNIT	1.5	2.0	2.3
	CORPS-TA TOTALS	6.0	4.0	18.0
LIST B				
	ITEM PER SIM UNIT	158.0	200.5	191.8
	CORPS-TA TOTALS	632.0	401.0	1534.0
M17 MASK				
	ITEM PER SIM UNIT	179.5	250.0	233.5
	CORPS-TA TOTALS	718.0	500.0	1868.0
PERSONNEL				
	ITEM PER SIM UNIT	179.5	250.0	233.5
	CORPS-TA TOTALS	718.0	500.0	1868.0
TRUCKS				
	ITEM PER SIM UNIT	61.0	75.0	72.0
	CORPS-TA TOTALS	244.0	150.0	576.0

(U) SIMULATION UNIT: ASP (SPECIAL) (NUCLEAR) UNIT

1. (U) Ref: TO&E 09084H1 w/Change 4

2. (U) Capabilities:

a. (U) One Ordnance Company, Ammunition (Nuclear, Special) is assigned per two Divisions in a Corps and one per TAACOM.

b. (U) Each Company at Corps establishes one field storage location and two ASPs (Spec), one for each of two Divisions supported. The Company at TAACOM establishes two field storage areas.

c. (U) Due to the fact that the identifiable part of the nuclear weapon supply operation takes place at the ASPs, and also that these are the locations of the majority of personnel and equipment, only the ASPs are modelled at Corps/Division level. At TAACOM, two ASPs will be used to simulate the two field storage areas.

d. (U) Each Division will have one ASP (Spec) to its rear in the Corps area, approximately 60km from the FLOT.

e. (U) Capability: Provides 100% of the Division requirement for special weapons.

3. (U) Aggregate SRCs:

NOMENCLATURE	SRC
Ord Bn, HHC	09066H100
Ammo Bn, Spec, HHC DS/GS	09086U400
Ammo Co, Spec, DS/GS	09084H100
Ammo Chem	09088S600
MP Sec Co	19097H400

Table A-13. (U) COMMAND, CONTROL AND COMMUNICATIONS SIMULATION UNIT

COMMAND, CONTROL AND COMMO UNIT		V CORPS	VII CORPS	THEA ARMY
SIM UNITS PER CORPS/TA		17.0	24.0	27.0
LIST A				
	ITEM PER SIM UNIT	.4	.2	1.0
	CORPS-TA TOTALS	7.0	5.0	28.0
LIST B				
	ITEM PER SIM UNIT	114.6	123.8	71.8
	CORPS-TA TOTALS	1947.0	2970.0	1939.0
M17 MASK				
	ITEM PER SIM UNIT	320.9	345.8	324.3
	CORPS-TA TOTALS	5456.0	8300.0	8756.0
M24 MASK				
	ITEM PER SIM UNIT	5.4	2.8	1.7
	CORPS-TA TOTALS	92.0	64.0	47.0
M25 MASK				
	ITEM PER SIM UNIT	.4	.3	0.0
	CORPS-TA TOTALS	6.0	6.0	0.0
OTHR-B				
	ITEM PER SIM UNIT	2.1	0.8	0.0
	CORPS-TA TOTALS	36.0	20.0	0.0
PERSONNEL				
	ITEM PER SIM UNIT	359.1	338.0	327.2
	CORPS-TA TOTALS	6104.0	8113.0	8835.0
TRUCKS				
	ITEM PER SIM UNIT	68.6	78.8	39.5
	CORPS-TA TOTALS	1167.0	1891.0	1066.0

(U) SIMULATION UNIT: COMMAND, CONTROL AND COMMUNICATIONS UNIT

1. (U) Refs: Applicable TOE
FM 101-10-2

2. (U) Capabilities:

a. (U) This simulation unit models the C3 capability at Brigade, Group, and higher. Therefore, the aggregation of units includes the HHC/HHD at those levels, plus non-Divisional communications units, other units which have a C3 function, and Civil Affairs organizations.

b. (U) As there is no accurate measurement by which to quantify the C3 function at this juncture, it can only be said that the C3 Unit simulates a certain portion of the total non-Divisional C3 capability.

c. (U) One C3 Unit will be allocated for each HQ of non-Divisional Brigade/Group or higher in the theater.

d. (U) No attempt will be made to degrade Division performance on the basis of C3 Unit loss until better C3 quantification methods are defined.

(U) SIMULATION UNIT: COMMAND, CONTROL AND COMMUNICATIONS UNIT (cont'd)

3. (U) Aggregate SRCs:

NOMENCLATURE	SRC
Area Sig Co	11417H620
Fwd Radio Co	11428H700
Cable/Wire Co	11423H710
Switch Co	11407H720
Sig Ops Co, Med HQ	11127H700
Sig HQ, Ops Co	11417H610
Sig Support Co	11409H710
Telephone Cntr Co	11408H700
Sig Co HQ, Tm	11500H4AC
Cmd Radio Co	11427H700
Spt Radio Co	11429H700
Signal Gp	11122H400
HHB, ADA Gp	44012H600
HHB, Arty Bde	06401H200
HHD, Ammo Gp	09062H100
HHC, Cmd Op Bn	11406H720
HHC, Sig Radio Bn	11426H700
HHC, Sig Auto Bn	11416H620
HHC, Spt Gp	29102H200
HHD, Avn Gp	01252H200
HHC, Engr Gp	05052H600
HHC, Engr Bde	05101H610
HHC, Corps Sig Bde	11402H700
HHC, Corps	52002H410
HHC, MP Bde	19262H420
HHC, Med Gp	08122H200
HHC, Med Bde	08122H600
HHC, Trans Bde	55062H200
HHD, MI Gp	34102J120
HHC, COSCOM	54022H800
MMC	54023H510
Movement Control Ctr	55006H000
Movement Control Tm	555&0H7LH
RAOC	52500J1AA
HQ, Civil Affairs Bde	41012H200
MP Group	19272H410
Civil Affairs Units	(notional)

Table A-14. (U) ENGINEER SIMULATION UNIT

ENGINEER SIMULATION UNIT		V CORPS	VII CORPS	THEA ARMY
SIM UNITS PER CORPS/TA		33.0	36.0	108.0
LIST A				
LIST B	ITEM PER SIM UNIT	.3	.2	.4
	CORPS-TA TOTALS	10.0	8.0	38.0
M17 MASK	ITEM PER SIM UNIT	124.1	120.7	85.2
	CORPS-TA TOTALS	4094.0	4345.0	9197.0
M24 MASK	ITEM PER SIM UNIT	207.7	191.4	257.8
	CORPS-TA TOTALS	6855.0	6891.0	27844.0
M25 MASK	ITEM PER SIM UNIT	.6	0.0	.4
	CORPS-TA TOTALS	21.0	0.0	42.0
OTHR-B	ITEM PER SIM UNIT	5.8	2.4	0.0
	CORPS-TA TOTALS	190.0	83.0	0.0
PERSONNEL	ITEM PER SIM UNIT	.1	.1	.1
	CORPS-TA TOTALS	2.0	3.0	16.0
TRUCKS	ITEM PER SIM UNIT	216.1	192.1	150.8
	CORPS-TA TOTALS	7130.0	6914.0	16283.0
	ITEM PER SIM UNIT	46.0	45.7	38.6
	CORPS-TA TOTALS	1519.0	1646.0	4167.0

(U) SIMULATION UNIT: ENGINEER UNIT

1. (U) Refs: A. FM 101-10-2
B. TO&E 05079H400 (Assault Float Bridge Co)
C. TO&E 05064H200 (Mobile Assault Bridge Co)
D. TO&E 05077H200 (Panel Bridge Co)
E. TO&E 05074H400 (Medium Girder Bridge Co)
F. TO&E 05148H730 (MAB Bridge Co)
G TO&E 05079J200 (Assault Float Rib Bridge Co)

2. (U) Capabilities:

a. (U) The Corps and Theater Engineer capability encompasses bridging, construction, laying and breaching minefields, ADM employment, and creating and breaching barriers. Of these, only bridging and barrier construction will be given values here.

b. (U) Bridging:

TYPE UNIT	QTY	UNIT CAPABILITY	TOTAL CAPABILITY
Mbl Aslt	2	696 ft (212m) Cl 60 Br	1392 ft (424m)
Panel	0	1 x 58.5m Bailey Cl 60 Br	0
Med Girder	4	4 x 103 ft (31.5m) Cl 60 Br	1648 ft (504m)
MAB	0	1 x 541 ft (161m) Cl 60 Br and 6 AVLB (18m, 59 ft)	0
Aslt Float	4	700 ft (213m) Cl 60 Float Br	2800 ft (852m)
Aslt Float (Rib)	0	700 ft (213m) Cl 60 Float Br	0
		TOTAL BRIDGE CAPABILITY	5840 ft (1780m)

c. (U) Simulation Engineer Unit Bridging Capability:
Total capability/* Units Aggregated = 5840/41 = 142.43 ft (73m), which represents .025 Corps bridging capability.

d. (U)For barrier construction, assume that one Combat Engineer Company would normally support one forward brigade in a Division. Therefore, two Combat Engineer Companies would support a Division in preparation of barriers. There are 24 Combat Engineer Companies for this aggregation, and 41 total units aggregated. Each simulation unit would therefore represent 24/41 of one Combat Engineer Company barrier construction capability (.59). As we assumed that two Combat Engineer Companies would normally support a Division, the simulation unit represents .5 x .59 = .29 of the barrier construction effort normally provided to a Division.

(U) SIMULATION UNIT: ENGINEER UNIT (cont'd)

3. (U) Aggregate SRCs:

NOMENCLATURE	SRC
HHC, Combat Engr Bn	05036H500
HHC, Cbt Engr Bn, Hvy	05116H300
Cbt Engr Co, Hvy Bn	05118H300
Combat Engr Co	05037H500
Engr Co, Mbl Aslt Br	05064H200
Aslt Br Co, Flt	05079H400
Engr Co, Rib Br	05079H400
Panel Br Co	05077H200
Med Girder Br Co	05074H400
Bridge Co, MAB	05148H730
Engr Co, Equip Maint	05117H300
Engr Cbt Sup Equip Maint	05058H400
EOD Control Center	09520H4AA
Engr Co, ADM, Corps	05057H500
Engr Co, Dump Tk	05124H600
Carto Co	05337H600
Engr Co, Camouflage	05097G700
Engr Bn HQ, Tm	05500H2AC
Engr Terrain, Tm	05540H3IJ

Table A-15. (U) GENERAL SUPPLY AND SERVICE SIMULATION UNIT

GENERAL SUPPLY AND SERVICE SIMULATION UNIT		V CORPS	VII CORPS	THEA ARMY
SIM UNITS PER CORPS/TA		6.0	5.0	15.0
LIST A				
	ITEM PER SIM UNIT	.5	1.6	.5
	CORPS-TA TOTALS	3.0	8.0	8.0
LIST B				
	ITEM PER SIM UNIT	110.5	104.4	104.2
	CORPS-TA TOTALS	663.0	522.0	1563.0
M17 MASK				
	ITEM PER SIM UNIT	250.0	229.6	231.0
	CORPS-TA TOTALS	1500.0	1148.0	3464.0
OTHER-B				
	ITEM PER SIM UNIT	3.3	3.2	3.2
	CORPS-TA TOTALS	20.0	16.0	48.0
PERSONNEL				
	ITEM PER SIM UNIT	250.0	229.6	231.0
	CORPS-TA TOTALS	1500.0	1148.0	3464.0
TRUCKS				
	ITEM PER SIM UNIT	43.0	44.0	41.9
	CORPS-TA TOTALS	258.0	220.0	629.0

(U) SIMULATION UNIT : GENERAL SUPPLY AND SERVICE UNIT

1. (U) Refs: A. FM 101-10-2
   B. TO&E 29147H520
   C. TO&E 29118H300

2. (U) Capabilities:

   a. (U) Of the units aggregated under this simulation unit, only two have capabilities which must be simulated: General Supply Co, GS and Supply and Service Co, DS. Their capabilities are shown below.

   b. (U) Capabilities:

	UNIT	
	S&S Co,DS	GEN SUP Co,GS
QUANT/CORPS	8	4
CAPABILITY BY SUPPLY CLASS		
Class I	40.725 s/tons	165 s/ton/day
Class II	52.275 s/tons	100
Bulk Class III	81,900 gals	-0-
Pkg Class III	9.375 s/tons	-0-
Class IV	63.75 s tons	120
Class VII	20.08 s/tons	10
Water	180,000 gals at 6 locations (treat contaminated water at 180,000 gals/hr)	-0-

   c. (U) A General Supply Company, by TO&E, can handle 165 s/tons/day Class I, and 235 s tons day of combined Classes II, IV and VII. This tonnage has been allocated as shown above based on the estimated requirements of supported units. Supply and Service capabilities are as shown.

   d. (U) For modelling purposes, the number of simulation units (General Supply and Service) should be varied according to the following points:

      (1) (U) Gen Sup Cos, GS, support DISCOMS and S&S Cos, DS.

(U) SIMULATION UNIT: GENERAL SUPPLY AND SERVICE (cont'd)

(2) (U) S&S Cos. DS. primarily support non-divisional troops.

(3) (U) The normal path followed by Classes I, II and IV supplies, and some Class VII, is from TA to Terminal Transfer Points, to Gen Sup Co, to S&S Co or DISCOM.

(4) (U) Gen Sup Co capacities, therefore, determine the supply flow rates to Divisions and supported Corps troops through S&S Companies or DISCOMs.

(5) (U) Simulation unit locations can be established so that one unit is allocated for each S&S Co and two for each Gen Sup Co. GS. Tonnages can be adjusted so that they approximate the normal flow through those points.

e. (U) From the above, capability of the simulation General Supply and Service Unit initially may be taken to be:

SUPPLY CLASS	CAPACITY
I	80 s/tons/day
II	52 s/tons/day
III (Pkg)	9 s/tons/day
IV	60 s/tons/day
VII	5 s/tons/day
Water*	126,000 gals at 4 locations
Treat NBC contaminated water*	126,000 gals/hr

*(U) Factor of .7 times the regular S&S Co rate.

(U) Established by: No of S&S Cos in Notional Corps\No of S&S Cos + No os Gen Sup Cos in Notional Corps - 7/7+3 - .7.

(U) SIMULATION UNIT: GENERAL SUPPLY AND SERVICE UNIT (cont'd)

3. (U) Aggregate SRCs:

NOMENCLATURE	SRC
Sup & Serv Co, DS	29147H520
Fwd Fld Ser Co, GS	29114H400
Gen Sup Co, GS	29118H300
Gen Sup Co, GS	29118H100
Air Drop Sup Co	10407H300
Air Drop Eq Rep Sup Co	10417H400
HHD, S&S Bn	29146H500

Table A-16. (U) HEAVY MATERIEL SUPPLY SIMULATION UNIT

HEAVY MATERIEL SUPPLY SIMULATION UNIT		V CORPS	VII CORPS	THEA ARMY
SIM UNITS PER CORPS/TA		1.0	1.0	4.0
LIST A				
	ITEM PER SIM UNIT	3.0	3.0	3.0
	CORPS-TA TOTALS	3.0	3.0	12.0
LIST B				
	ITEM PER SIM UNIT	54.0	54.0	54.0
	CORPS-TA TOTALS	54.0	54.0	216.0
M17 MASK				
	ITEM PER SIM UNIT	181.0	181.0	181.0
	CORPS-TA TOTALS	181.0	181.0	724.0
M25 MASK				
	ITEM PER SIM UNIT	1.0	1.0	1.0
	CORPS-TA TOTALS	1.0	1.0	4.0
PERSONNEL				
	ITEM PER SIM UNIT	183.0	183.0	183.0
	CORPS-TA TOTALS	183.0	183.0	732.0
TRUCKS				
	ITEM PER SIM UNIT	23.0	23.0	23.0
	CORPS-TA TOTALS	23.0	23.0	92.0

(U) SIMULATION UNIT: HEAVY MATERIEL SUPPLY UNIT (CLASS VII)

1. (U) Refs: TOE 29127H200

2. (U) Capabilities:

   a. (U) Class VII tonnage processing capability:
   Combat Zone - 666 s/tons/day; COMZ - 765 s/tons/day

   b. (U) The unit is capable of receiving, storing, issuing 150 short tons of Bridging and Fortification materials per day. This translates to an average sustained rate of 50 tons issued per day.

   c. (U) Because Class VII includes all wheeled and tracked major end items, only a portion of the Class VII tonnage capability can be devoted to replacement of tanks, although they will constitute the greatest percentage of major end items replaced. Assume 600 s/tons/day devoted to tanks. This represents 600/40 - 15 tanks processed and shipped forward per day.

   d. (U) Simulation Unit Combat Zone Capability:
   1. Ship 15 tanks forward as replacements
   2. Issue 50 tons of Bridging and Class IV
   3. Ship 66 tons of other Class VII

   e. (U) COMZ Capability: 16% greater.

3. (U) Aggregate SRCs:

NOMENCLATURE	SRC
Hvy Mat Sup Co (GS)	29127H200

Table A-17. (U) HOSPITAL SIMULATION UNIT

HOSPITAL SIMULATION UNIT		V CORPS	VII CORPS	THEA ARMY
SIM UNITS PER CORPS/TA		12.0	21.0	50.0
LIST A				
	ITEM PER SIM UNIT	.9	.8	1.2
	CORPS-TA TOTALS	11.0	16.0	58.0
LIST B				
	ITEM PER SIM UNIT	81.3	67.2	16.3
	CORPS-TA TOTALS	975.0	1411.0	817.0
M17 MASK				
	ITEM PER SIM UNIT	330.1	363.6	2C4.4
	CORPS-TA TOTALS	3961.0	7636.0	10222.0
M24 MASK				
	ITEM PER SIM UNIT	12.2	1.4	1.7
	CORPS-TA TOTALS	148.0	29.0	87.0
PERSONNEL				
	ITEM PER SIM UNIT	342.3	364.7	205.7
	CORPS-TA TOTALS	4107.0	7659.0	10284.0
TRUCKS				
	ITEM PER SIM UNIT	46.1	35.6	8.8
	CORPS-TA TOTALS	553.0	747.0	439.0
OTHR-B				
	ITEM PER SIM UNIT	3.8	2.6	.4
	CORPS-TA TOTALS	46.0	55.0	21.0

Table A-18. (U) MAINTENANCE SIMULATION UNIT

MAINTENANCE SIMULATION UNIT		V CORPS	VII CORPS	THEA ARMY
SIM UNITS PER CORPS/TA		7.0	12.0	24.0
LIST A				
	ITEM PER SIM UNIT	6.6	6.8	6.8
	CORPS-TA TOTALS	46.0	80.0	160.0
LIST B				
	ITEM PER SIM UNIT	104.4	97.3	88.3
	CORPS-TA TOTALS	731.0	1168.0	2118.0
M17 MASK				
	ITEM PER SIM UNIT	255.6	225.8	244.3
	CORPS-TA TOTALS	1789.0	2709.0	5864.0
M24 MASK				
	ITEM PER SIM UNIT	8.7	5.1	1.4
	CORPS-TA TOTALS	61.0	61.0	33.0
M25 MASK				
	ITEM PER SIM UNIT	1.1	1.0	.8
	CORPS-TA TOTALS	8.0	12.0	18.0
OTHR-B				
	ITEM PER SIM UNIT	.1	0.0	.7
	CORPS-TA TOTALS	1.0	0.0	15.0
PERSONNEL				
	ITEM PER SIM UNIT	265.3	236.2	250.3
	CORPS-TA TOTALS	1857.0	2834.0	6008.0
TRUCKS				
	ITEM PER SIM UNIT	48.0	46.1	37.8
	CORPS-TA TOTALS	337.0	553.0	906.0

ANNEX A

CAPABILITIES OF SIMULATION UNITS (U)

(U) SIMULATION UNIT: HOSPITAL

1. (U) REFS: A. Army Hospital TO&E
B. FM-101-10-2

2. (U) Strength and Capacity:

a. (U) TO&E Hospitals:

Hospital	Strength	Beds	Quant	Total Strength	Total Beds
MASH	120	60	4	480	240
Evac Hosp	342	400	8	2736	3200
Comb Spt Hosp	233	200	4	932	800
(Med Dets)	200	-	(1)	200	-
TOTAL	-	-	16	4348	4240

b. (U) TO&E Medical Units:

Det/Cos	Strength	-	Quant	Total Strength
Bde HHC	77	-	1	77
Medsom Co	157	-	1	157
Air Ambl Co	197	-	1	197
Med Dets	400	-	1	400
Gp HHD	47	-	4	188
Bn HHD	40	-	4	160
C3 Co	190	-	4	760
Clearing Co	133	-	4	532
Ambl co	100	-	4	400
(Med Dets)	150	-	4	600
TOTAL				3471

+ Representative Bn: 1 x HHC 10-296H (110)+ 410
3 x Cos 10-297H (330) 3881

(U) SIMULATION UNIT: HOSPITALS (cont'd)

3. (U) Aggregate Strength: 3881 + 4348 = 8229

4. (U) Simulation Strength and Capacity

Mean Strength:	8229/16	=	514
Mean Bed Capa:	4240/16	=	265

5. (U) Aggerate SRCs:

NOMENCLATURE	SRC
MASH	08063H000
Evac Hosp	08581J100
Combat Sup Hosp	08123J100
Ambulance Co	08127H410
Clearing Co	08128H400
Opt Min Sup Co	08287H600
Sep Med Co	08147H000
Helo Ambu Det	08660H0RA
Ento Tm	08620H0LA
Envir & Sani Tm	08620H0LB
Envir Det	08620H0LC
Psych Svc Tm	08620H00M
Fld Ambu Tm	08660H0RE
Surgical Tm	08630H0KA
Ortho Tm	08630H0KB
Max Fac Tm	08630H0KD
Neuro Tm	08630H0KE
Thoracic Tm	08630H0KF
Anesth Tm	08630H0KG
Centl Mat Tm	08630H0MP
Dental Tm	08670H8AI
Dental Svc Tm	08670H8AJ
Dental Det	08670H8HA
Dental Det	08670H8HC
Dental Det	08670H8HD
Vet Svc Tm	08680H8JB
Vet Svc Tm	08680H8JA
Dispen	08620H00A
HHC, Bde	08112H600
HHD, GP	08112H200
HHD, Bn	08126H300
Medsom	08287H600
HQ, Prev Med	08287H600

(U) SIMULATION UNIT: MAINTENANCE UNIT

1. (U) Refs: A. FM 101-10-2
B. TO&E 29209H900 (Maint Co, Non-Div, DS)
C. TO&E 29134H200 (Lt Equip Maint Co)
D. TO&E 29137H200 (Hvy Equip Maint Co)
E. TO&E 09117G600 (Tire Repair Co)
F. TO&E 09550HXXX (Maint Augmentation Tms)
G. TO&E 55459J300 (Trars A/C Maint Co)
H. TO&E 09059H200 (A/D Maint Co)
I. TO&E 29119H510 (Repair Parts Co)
J. TO&E 29129H800 (A/C & Msl Repair Parts Co)

2. (U) Capabilities: (SEE FOLLOWING PAGE)

3. (U) Repair Parts Supply (Class IX)

a. (U) Each Repair Parts Company handles:
59 s/tons/day, Corps;
76 s/tons/day, Theater Army

b. (U) Simulation Unit Capability:
50 tons x 2 Cos/20 Units = 5.9 s/tons/day, Corps
7.6 s/tons./day = Theater Army

4. (U) Aggregate SRCs:

NOMENCLATURE	SRC
HHD, Mnt Bn, DS	20136H300
HHD, Mnt Bn, GS	29136H300
HHD, A/C Mnt Bn	55456H400
HHC, Msl Spt Bn	09036Hxxx
Lt Equip Maint Co	29134H200
Hvy Equip Maint Co	29137H200
Trans A/C Mnt Co	55459J300
Rkt & Msl Mnt Co	09550Hxxx
Mnt Co, DS	29209H900
Augment Tms, DS	09550Hxxx
AD Mnt Co	09059H200
Tire Repair Co	09117G600
Repair Parts Co	29119H510
A/C & Msl Rep Pts Co	29129H800
Svc Co, Class & Col	20139H300

2. (U) Capabilities:

Maintenance, Annual Man-Hours/Unit & Total Units

UNIT BY TOE REFERENCE, ABOVE

TYPE MAINTENANCE	B	C	D	F	(G, see below)
Automotive	72.9		213.3	29.7(x2); 21.6(x6);	51.3(x2); 16.2(x2); 21.6(x3)
Engineer	13.5		24.3	13.5(x4)	
Power Gen'r	64.8	124.2		5.4(x4);	5.4; 21.6(x3); 10.8(x2)
QM Equip	13.5	2.7	5.4	2.7(x2);	5.4(x2)
Small Arms	5.4			2.7(x2)	
Canvas	5.4	2.7	10.8		
Metal Work	18.9	16.2			
Commo-Elec	21.6	67.5; 62.1		5.4(x3);	2.7(x6); 5.4(x2); 2.7
Chemical	2.7	40.5			
Spec Elec (Radar)	2.7	2.7; 2.7; 21.6; 5.4			
Tank Turret				27.0(x2)	
Arty				5.4(x6)	
Fire Con Inst			10.8	5.4(x2);	2.7(x6)
Fire Con Computer				2.7(x2);	2.7(x6)
Camera		2.7			
Meteorological		2.7			
Refrigeration		21.6		2.7(x3)	
Armaments		40.5			

G	
Turbine Eng	75.6
Rotor Prop	21.6
Power Train	13.5
A/C Electrical	8.1
A/C Inst	5.4
A/C Electronic	2.7
Airframe	62.1
A/C Armaments	29.7
Avionics	72.9
A/C Fire Control	18.9
Machinist	5.4
Hydraulics	8.1
AH-1G	24.3
OH-58	16.2
UH-1	64.8
CH-47	40.5

* (U) On average, each man produces 29 hours/week.

Table A-19. (U) PERSONNEL AND ADMINISTRATION SIMULATION UNIT

PERSONNEL AND ADMINISTRATION UNIT		V CORPS	VII CORPS	THEA ARMY
SIM UNITS PER CORPS/TA		6.0	6.0	18.0
LIST A				
	ITEM PER SIM UNIT	3.8	3.5	3.5
	CORPS-TA TOTALS	22.0	21.0	63.0
LIST B				
	ITEM PER SIM UNIT	40.8	30.7	42.7
	CORPS-TA TOTALS	245.0	184.0	769.0
M17 MASK				
	ITEM PER SIM UNIT	205.6	208.6	176.7
	CORPS-TA TOTALS	1234.0	1252.0	3180.0
M24 MASK				
	ITEM PER SIM UNIT	.8	.8	0.0
	CORPS-TA TOTALS	4.0	4.0	0.0
PERSONNEL				
	ITEM PER SIM UNIT	216.3	209.7	183.9
	CORPS-TA TOTALS	1298.0	1258.0	3311.0
TRUCKS				
	ITEM PER SIM UNIT	19.7	13.2	23.8
	CORPS-TA TOTALS	118.0	79.0	429.0
OTHR-B				
	ITEM PER SIM UNIT	.3	.5	.8
	CORPS-TA TOTALS	2.0	3.0	15.0

(U) SIMULATION UNIT: PERSONNEL AND ADMINISTRATION UNIT

1. (U) Refs: A. FM-101-10-2
   B. TOE 12560H2GA
   C. TOE 12560H2GB
   D. TOE 12560H2FA

2. (U) Capabilities:

   a. (U) The only capability modelled from among those of the units aggregated under this simulation unit is that of personnel replacement flow control. This function is performed by the Replacement Operations Teams (GA or GB) and the Replacement Control Teams (FA). These capabilities are shown below.

   b. (U)

Capabilities	Corps Allocations	Replacements Processed each	Total Replacements
Team FA	2	100	200
Team GA	0	200	0
Team GB	2	400	800
			1000

   c. (U) The simulation Personnel and Administrative Unit strength is modelled on the existence of the four teams shown; therefore, the capability simulated per unit is 1000/4, or 250 replacements processed per day.

(U) SIMULATION UNIT: PERSONNEL AND ADMINISTRATION UNIT (cont'd)

3. (U) Aggregate SRCs:

NOMENCLATURE	SRC
Replacement Team	12560H2GA
Replacement Op Tm	12560H2GB
Replacement Control Tm	12560H2FA
Personnel Service Co	12067H550
Mess Team (400)	12560H2CB
Team HQ (15,000)	12550H2AC
HHD P&A Bn	12066H220
HHC Sp Troops COSCOM	54022H800
Mail Tm (P)	12550H2IB
Mail Tm (P) 15,000	12550H2FE
Postal HQ Tm	12550H2AB
Postal Finance Tm	12550H2GD
Finance Sup Cntr	14202J100
Area Finance Sup Cntr	14203J100
Intn'l Exch Office	12550H2LB
CID Team	19620H8GA
CID Det	19620H8GC
CID Det Field Office	19620H8GB
Postal Det HQ (400)	12560H2AB
Det Control HQ	12560H2AC
Dispersing & Acct Tm	14500H6FA
Military History Det	20017H300
Military Law Cntr	17600J2AA
Intn'l Law Tm	27600J2GA
Public Affairs Tm	46500H6FA
Band	12107H500
ADP Unit	29550T720

Table A-20. (U) PETROLEUM SIMULATION UNIT

PETROLEUM SIMULATION UNIT		V CORPS	VII CORPS	THEA ARMY
SIM UNITS PER CORPS/TA		6.0	6.0	8.0
LIST A				
	ITEM PER SIM UNIT	1.0	.8	.6
	CORPS-TA TOTALS	6.0	4.0	5.0
LIST B				
	ITEM PER SIM UNIT	171.3	96.0	99.3
	CORPS-TA TOTALS	1028.0	576.0	794.0
M17 MASK				
	ITEM PER SIM UNIT	226.7	170.8	181.9
	CORPS-TA TOTALS	1360.0	1025.0	1455.0
PERSONNEL				
	ITEM PER SIM UNIT	226.7	170.5	181.4
	CORPS-TA TOTALS	1360.0	1023.0	1451.0
TRUCKS				
	ITEM PER SIM UNIT	80.5	45.3	48.0
	CORPS-TA TOTALS	483.0	272.0	384.0

(U) SIMULATION UNIT: PETROLEUM UNIT (CLASS III SUPPLY)

1. (U) Refs: A. TOWE 10207H300 (Petroleum Pipe and Terminal Co)
B. TOWE 10227H500 (Petroleum Supply Co)
C. TOWE 55018H620 (Medium Truck Co. Petroleum)
D. FM-101-10-2

2. (U) Capabilities:

a. (U) Among those companies aggregated to form the basis of this simulation unit, the three for which the TOWEs are listed as Refs A., B. and C. above are those which have capabilities to be simulated. These capabilities are shown below.

b. (U) Petroleum Pipe and Terminal Company:
1. Establish two tank farms
2. Operate 100 km of pipeline
3. Store up to 500,000 bls Class III
4. Dispense 52,000 gals/day.

c. (U) Petroleum Supply Company:
1. Store 1,480,000 gals Class III
2. Dispense 685,000 gals/day.

d. (U) Medium Truck Co. Petroleum:
1. Line hauls - deliver 225,000 gals/day
2. Local hauls - deliver 450,000 gals/day
3. Above figures assume 75% vehicle availability and unit operating 2 shifts/day.

e. (U) Notional Corps structure was used in computing the aggregates for this simulation unit, and the results compared with actual corps organizations. In-place corps in Europe, without reinforcement, have unique structures for Class III supply.

f. (U) Notional Corps structure:
5 x Petrol Supply Co and 15 Medium Truck Co. Petrol.
Therefore, total Notional capability is:
a. Storage: 5 x 1,480,000 gals - 7,400,000 gals
b. Dispense: 5 x 685,000 gals day - 3,425,000 gals/day
c. Deliver:
Line haul: 15 x 225,000 gals/day - 3,375,000 gals/day
or
Local haul: 15 x 450,000 gals/day - 6,750,000 gals/day.

(U) SIMULATION UNIT: PETROLEUM UNIT (CLASS III SUPPLY) (cont'd)

g. (U) From f. above, limiting figure is Line Haul delivery at 3,375,000 gals/day. Therefore, the dispensing capability of the Petroleum Simulation Unit is 3,375,000/5, or 675,000 gals/day

h. (U) The storage capacity is that of one Petroleum Supply Company, i.e., 1,480,000 gals.

3. (U) Aggregate SRCs:

NOMENCLATURE	SRC
Petrol Supply Co	10227E500
Med Truck Co. Petrol	55018H620
Petrol Pipe & Term'l	10207H300
Lab Base Tm	10102S610
Lab Tm	10102S600
Petrol Op Tm	10560H6JA
HHC, Petrol Supply Bn	10226Hxxx
HHD, Petrol Bn	10226H500

Table A-21. (U) SUPPORT SIMULATION UNIT

SUPPORT SIMULATION UNIT		V CORPS	VII CORPS	THEA ARMY
SIM UNITS PER CORPS/TA		26.0	22.0	27.0
LIST A				
	ITEM PER SIM UNIT	.5	.3	1.2
	CORPS-TA TOTALS	14.0	6.0	33.0
LIST B				
	ITEM PER SIM UNIT	80.5	88.1	179.3
	CORPS-TA TOTALS	2094.0	1939.0	4641.0
M17 MASK				
	ITEM PER SIM UNIT	129.7	129.3	263.4
	CORPS-TA TOTS	3372.0	2845.0	7112.0
M24 MASK				
	ITEM PER SIM UNIT	4.6	6.2	0.0
	CORPS-TA TOTALS	119.0	136.0	0.0
M25 MASK				
	ITEM PER SIM UNIT	1.3	.7	0.0
	CORPS-TA TOTALS	34.0	16.0	0.0
OTHR-B				
	ITEM PER SIM UNIT	.3	.1	.1
	CORPS-TA TOTALS	7.0	1.0	1.0
PERSONNEL				
	ITEM PER SIM UNIT	135.6	136.4	263.1
	CORPS-TA TOTALS	3525.0	3000.0	7103.0
TRUCKS				
	ITEM PER SIM UNIT	34.4	36.2	177.6
	CORPS-TA TOTALS	894.0	797.0	1421.0

(U) SIMULATION UNIT: SUPPORT UNIT (cont'd)

1. (U) Refs: A. TOSE 03107H000 (NBC Def Co)
   B. FM 101-10-2

2. (U) Capabilities:

   a. (U) While the organizations aggregated (see papa. c, below) with the NBC elements are many and varied, the only functions modelled with the Support simulation unit are NBC Decontamination and Reconnaissance.

   b. (U) TOSE NBC Company capability is to operate 15 Decontamination points, each of which can decontaminate two Company equivalents of personnel or equipment, or some combination thereof, including issuing clothing, per 12 hour period. Said another way, one point can accommodate the decontamination of the personnel and equipment of one Company per 12 hour period.

   c (U) Corps structures examined revealed one NBC Company per Corps, reinforced with five or six teams of various types, including Operations Center, Reconnaissance and Decontamination. Therefore, the aggregated strength total has been divided by 20 to determine the simulation Support Unit strength. Similarly, the capability of each Support Unit will be established as decontamination of 15 20, or .75 of a Company in a 12 hour period. Performance of reconnaissance will be taken as 1/20, or .05 of the Corps NBC reconnaissance capability.

(U) SIMULATION UNIT: SUPPORT UNIT (cont'd)

3. (U) Aggregate SRCs:

NOMENCLATURE	SRC
NBC Tm	03500H2JA
NBC Element	03500H2JB
NBC Recon Tm	03500H2LA
NBC Def Co	03107H000
MP Company	19077H410
HHD, MP Bn	19076H400
HHD, Smoke Bn	03266H200
HHD, MI Bn (CEWI)	34106J120
Smoke Co	03267H200
Decon Tm	03500H2FB
C&C Psyop	33500H0AA
Support Tm, Psyop	33500H0BA
Loudspeaker Tm	33500H0HB
Propaganda Tm	33500H0FA
Current Intel Tm	33500H0FC
Res & Analysis Tm	33500H0FD
Lt Printing Tm	33500H0GA
Audio/Visual Tm	33500H0HC
Sup/Maint Tm	33500H0BA
Interrogation Co	34127J120
MI Co, Corps	30018H00C
HS Co, MI, CEWI Bn	34126J120
Ops Sec Co, MI Bn	34128J120
EW Co, MI Bn	34129J120
Ops Co, MI Bn	34107J120
Com Co, MI Bn	34108J120
Avn Co, CEWI Bn	34147J000
Avn Co, CEWI Bn	34148J000

Table A-22. (U) TRANSPORTATION TRANSFER SIMULATION UNIT

TRANSPORTATION TRANSFER SIMULATION UNIT		V CORPS	VII CORPS	THEA ARMY
SIM UNITS PER CORPS/TA		13.0	13.0	18.0
LIST A				
	ITEM PER SIM UNIT	3 3	2.0	2.6
	CORPS-TA TOTALS	43.0	26.0	46.0
LIST B				
	ITEM PER SIM UNIT	174.8	142.4	180.4
	CORPS-TA TOTALS	2272.0	1851.0	3248.0
M17 MASK				
	ITEM PER SIM UNIT	248.5	176.8	206.7
	CORPS-TA TOTALS	3231.0	2298.0	3720.0
PERSONNEL				
	ITEM PER SIM UNIT	240.9	176.8	206.7
	CORPS-TA TOTALS	3132.0	2298.0	3720.0
TRUCKS				
	ITEM PER SIM UNIT	91.9	61.1	69.5
	CORPS-TA TOTALS	1195.0	794.0	1251.0

(U) SIMULATION UNIT: TRANSPORTATION TRANSFER UNITS

1. (U) Refs: A. TOE 55017H520
B. TOE 55067J400
C. TOE 55018H610
D. TOE 55028H200
E. TOE 55118H710

2. (U) Capabilities:

Lt Truck Cos (18)	1080	540	19,440	9,720
Med Truck Cos (8)	4500	2250	36,000	18,000
Hvy Truck Cos (2)	2880	1440	5,760	2,880
	(72 tanks)	(36 tanks)	(144 tanks)	(36 tanks)

a. (U) TTPs function at two shifts/day.

b. (U) Local Haul - 4 round trips/day of 24 kms per one way trip.
Line Haul - 2 round trips/day of 144 kms per one way trip.

c. (U) At 90% strength, TTUs function at 90% capacity (straight line)
At 84% strength, TTUs function at 80% capacity (straight line)
At 50% strength, TTUs function at 48% (47.5%) capacity (straight line)

d. (U) Below 50%, the curve of % capacity approaches zero as strength approaches 20%.

e. (U) Vehicle capacity - 75%.

f. (U) 60% effort of Lt Truck Cos and Med Truck Cos are assigned to support Division assets; 40% are assigned to support Corps assets.

g. (U) Assume 100% effort of all Hvy Truck Cos are assigned to support Divisions.

h. (U) Total Capability, Lt-Med Truck Cos (s/tons/day)

		Local	Line	
Lt Truck Co		19,440	9,720	
Med Truck Co		36,000	18,000	
		55,440	27,720	
	9 -	6,160	3,080	(s/tons/day)
Hvy Truck	9 -	640	320	(s/tons/day)
		(16 tanks)	(8 tanks)	(tanks/day, or other Hvy Class VII)

(U) SIMULATION UNIT: TRANSPORTATION TRANSFER UNIT (cont'd)

i. (U) Assume tanks delivered straight through.

j. (U) Lt & Med Truck Cos:
(.6 x 6/60) + (.4 x 3,080) = 3696 +1232 = 4928 s/tons/day.

k. (U) Storage: Assume 1/3 of supplies static at any one time:
1/3 x 4928 = 1643 s/tons, not including tanks.

3. (U) Aggregate SRCs:

NOMENCLATURE	SRC
Lt Truck Co	55017H520
Lt-Med Truck Co	55067J400
Med Truck Co	55018H610
Hvy Truck Co	55028H200
Terminal Trans Co	55118H710
Command Trans Co	55019J310
HHD Trans Bn	55016H400

(U) SIMULATION UNIT: PORT UNIT

1. (U) Refs: A. FM 101-10-2

2. (U) Capabilities:

a. (U) Cargo handling units which may be assigned to a Transportation Transfer Bn, and their capabilities (s/tons/day):

a.	Terminal Svc Co	1000
b.	Medium Boat Co	720
c.	Hvy Boat Co	1440
d.	Lt Amph Co	1000
e.	Med Amph Co	801
	TOTAL	5240

$$\text{Mean} = \sum a - e/5 = 1048$$

b. (U) The mix of the above type units for any Terminal Bn depends on port dock facilities or over-the-shore requirements. Due to the fact that most Ports will require break-bulk capability of the Terminal Service Company, and given that the Terminal Service Company capacity (1000 s/tons/day) approximates the mean of the capacities of listed companies (1048), the Port Unit capability will be taken as 1000 short/tons/day.

3. (U) Aggregate SRCs

NOMENCLATURE	SRC
HHC Terminal Bn	55116Hxxx
Med Boat Co	55128H500
Hvy Boat Co	55129H500
Lt Amphib Co	55138H510
Med Amphib Co	55139H510
Lighterage Maint Co-DS	55158H700
Terminal Serv Co	55117H500
Trans Serv Co	55560Hxxx

APPENDIX B

TACTICAL DECISION RULES (USAGE RATES) FOR CHEMICAL DEFENSE EQUIPMENT (CDE) IN SUPPORT OF WARTIME REPLACEMENT FACTORS STUDY

ACN: 69349

US ARMY CHEMICAL SCHOOL

FORT MCCLELLAN, ALABAMA 36205

15 APRIL 1984

BY: CPT THOMAS KLEWIN
CPT RONALD LEVY

DISCLAIMER NOTICE

The findings of this report are not to be construed as an Official Department of the Army position, unless so designated by other authorized documents.

TABLE OF CONTENTS

FOREWORD

1. Since the initial submission of the Tactical Decision Rules (usage rates), changes in doctrine and the publishing of the Chemical School's keystone manuals (FM 3-5, 3-4, 3-3, 3-100) in final draft or published form have required that some of the original 33 Chemical Defense Equipment (CDE) items be rewritten to take into account new information relating to their consumption rate.

2. The CDE items listed on the following pages reflect not only those original usage rates which remain valid, but also those items which have had major changes in doctrine and which resulted in greater or lesser consumption rates. Changes or additions to the original rules are underlined.

INTRODUCTION

1. TITLE. Tactical Decision Rules (Usage Rates) for Chemical Defense Equipment in Support of the Wartime Replacement Factors Study.

2. PURPOSE. To provide Chemical Defense Equipment (CDE) usage rates which can be used as a partial basis in establishing new War Reserve Requirements. The tactical decision rules developed in this report are based upon equipment that is consumed through usage during a chemical attack and not conventional battle losses.

3. SCOPE

a. This report will address those CDE items which were identified to the Chemical School by the US Army Training and Doctrine Command (TRADOC). These items had originated from their item managers in the separate materiel commands, namely, US Armament Munitions and Chemical Command (AMCCOM), Army Medical Supply Agency (AMSA) and Defense Personnel Supply Center (DPSC).

b. The following is a list of 33 CDE items and the pages where information on their usage rates may be found in this report:

NOMENCLATURE	NSN	PAGE NO.
Filter Element, M13A2	4240-00-165-5026	B-13
Filter Canister, M10A1	4240-00-126-7186	B-13
Skin Decontamination Kit, M258A1	4230-01-101-3984	B-14
Battle Dress Overgarment/Overgarmet 84	8415-01-137-1704*	B-15
Boots, Chemical Protective	8430-01-021-5978	B-16
Gloves, Chemical Protective, 2.5 mil	8415-00-753-6550	B-16
Gloves, Chemical Protective, 14 mil	8415-01-138-2501	B-17
Gloves, Chemical Protective, 7 mil	8415-01-138-2497	B-17
Hood, M5	4240-00-860-8987	B-18
Hood, M6A2	4240-00-999-0420	B-18
Hood, M7	4240-00-021-8695	B-18
Winterization Kit, M3	4240-00-066-0181	B-19
Winterization Kit, M4	4240-00-065-0319	B-19
Detector Paper, Chem Agt M8	6665-00-050-8529	B-20
Detector Paper, Chem Agt M9	6665-01-049-8482	B-21
Decontaminating Apparatus, M11	4230-00-720-1618	B-23
Nitrogen Cylinder	4230-00-775-7541	B-24
DS-2, 1 1/3 qt can	6850-00-753-4827	B-25
DS-2, 5 gal pail	6850-00-753-4870	B-26
Decontaminating Apparatus, Portable, M13	4230-01-133-4134	B-27
NBC Marking Set	9905-12-124-5955	B-28
Detector Kit, Chem Agt M256	6665-01-016-8399	B-29
Battery, BA 3517/U, 36V	6135-00-450-3528	B-31
Refill Kit, M229	6665-00-859-2214	B-32
Filter Set, Gas & Particulate, M7A1	4240-00-203-3999	B-33
Gas Filter, M12A1	4240-00-289-7978	B-33

Particulate Filter, M13	4240-00-368-6291	B-33
Filter Set, Gas & Particulate, M8A3	4240-00-853-3201	B-34
Gas Filter, M12A1	4240-00-289-7978	B-34
Particulate Filter, M13	4240-00-368-6291	B-34
Filter Set, Gas & Particulate, M13A1	4240-00-964-9061	B-35
Particulate Filter, M19	4240-00-866-1825	B-35
Gas Filter, M18	4240-00-828-3952	B-35
Filter Unit, Gas & Particulate, M56/M59	4240-01-067-5605	B-36
GPFU, XM48M	4240-01-161-3710	B-37
Test Kit, Water, M272	0005-01-134-0885	B-38
Antidote Kit, MK1	6505-01-140-6455	B-39
Pralidoxime Chloride Injector	6506-01-125-3248	B-40
Diazepam	6505-00-137-5891	B-41

* Medium Size only

c. The following items from the original list published by the Logistics Center are not directly associated with a chemical attack or are being deleted from the inventory:

(1) M18 Headwound Mask - The M18 Headwound Mask is being considered as obsolete. This is due to the poor dispersion of carbon dioxide out of the mask.

(2) Amyl Nitrite - The use of Amyl Nitrite is currently under review since its effectiveness has been questioned. Further purchase of this item has been suspended.

(3) Tetracycline Hydrochloride - Tetracycline Hydrochloride has been recommended for deletion from CTA 8-100 since it is felt to be noneffective for treatment of most biological agents. The study will not address Biological Warfare.

(4) Indicator Tube, Carbon Monoxide - This is a component of the M23 Carbon Monoxide Detector Kit.

(5) M23 Carbon Monoxide Detector Kit - No consumption per chemical attack. The kit is a component of the M15 Breathing Apparatus.

(6) M20 Breathing Apparatus - No consumption per chemical attack. The breathing apparatus is used by Toxic Missile Fuel Handlers and EOD teams.

(7) M23A1 Breathing Apparatus - No consumption per chemical attack.

4. METHODOLOGY. The effort was conducted by individuals within the US Army Chemical School with assistance from the US Army Academy of Health Sciences, US Army Logistics Center, US Army Engineer School and the Chemical Research and Development Center, all of which supplied data on particular proponent items. The primary method through which tactical decision rules were established was by evaluating technical data in the light of doctrinal procedures. In those instances where a doctrinal procedure was not available, professional military judgement was exercised to formulate a rate of use. The

set of tactical decision rules developed were subjectively tested as to their validity by review by a Chemical School Officer Advance Course class. These tactical decision rules are to be incorporated into the TACWAR model which has been contracted through the Institute for Defense Analyses (IDA), certain adaptations were considered to allow for their use in the computer methodology.

5. ASSUMPTIONS. The following general assumptions were made during the development of the usage rules:

a. Soldiers are well trained in NBC protective actions. (Proficient in skill levels 1, 2, and 3, FM 21-2 and FM 21-3).

b. The following are probable threat agents with the duration expected for a European climate as indicated (information on threat agents derived from FM 3-9 and World Wide Handbook of Chemical Agents):

Agents	Duration
(1) Nonpersistent blood (NPB) - CK, AC	1 hour
(2) Nonpersistent nerve (NPN) - GB, GA	3 hours
(3) Semipersistent nerve (SPN) - GB, GD	8 hours
(4) Persistent nerve (PN) - TGD, V-Series	24-48 hours
(5) Persistent blister (PX) - HD, HL, CX	24-48 hours

c. Equipment usage rates are based upon doctrine and/or best use under given circumstances.

d. Tactical decision rules support the Airland Battle doctrine.

6. STUDY RESULTS. Data pertaining to the items of CDE addressed in the study are shown in Annex A.

ANNEX A

CHEMICAL DEFENSE EQUIPMENT FOR WARTIME REPLACEMENT FACTORS STUDY

M13A2 Filter Elements (4240-00-165-5026) and M10A1 Filter Canister (4240-00-126-7186)

INITIAL ISSUE: M13A2 - 2 sets per M17 series mask (LIN M11895)
M10A1 - 2 canisters per M24/M25 series mask (LIN M10936 & M11621)

USE: To filter chemical and biological agents from the air being breathed by the wearer of an M17 series or M24/M25 series chemical-biological protective mask.

ASSUMPTION - Replace every 30 days (FM 3-4 NBC Protection).

CONSUMPTION - M13A2 - 1 set per M17 series mask per 30 days or once after every blood agent attack

M10A1 - 1 per M24/25 series mask per 30 days or once after every blood agent attack.

REFERENCES: TM 3-4240-279-10
TM 3-4240-280-10
FM 3-4

M258A1 Skin Decontamination Kit (4230-01-101-3984)

INITIAL ISSUE: 2 per individual

USE: Used for skin and limited equipment decontamination. Limited equipment decontamination is defined as reducing the continuous contamination hazard on the individual weapon, hood, protective mask, butyl rubber gloves, hand tools, and other small metal, rubber, and plastic items which must be frequently handled while performing military duties.

ASSUMPTIONS: 1. After a chemical attack, only the survivors will use the kit.
2. 2 kits will decon skin, LBE, hood, etc., two times
3. Decon once per chemical attack

CONSUMPTION: Each survivor of a chemical attack (SPN, PN, PX) will expend 1 kit to decontaminate himself and his equipment.

REFERENCES: TM 3-4230-213-10
CTA 50-970
Msg, ATCD-N, HQ, TRADOC, dtd 281420Z Oct 80, subject: M258A1 Skin Decon Kit
CPT Jay Hanline, Project Officer, Physical Protection, MSD, DCD, USACMLS, Jan 84

Battle Dress Overgarment (BDO)/Overgarment 84 (OG-84)
(8415-01-137-1704 Medium Size Only)

INITIAL ISSUE: 2 sets per soldier (1 for wear, 1 for reserve)

USE: Protect the soldier from liquid chemical agents and chemical agent vapors.

ASSUMPTIONS:

1. Set will provide 30 days wear when there is no liquid chemical agent challenge.
2. Soldiers in chemical companies (DECON only) will use 1 overgarment per day.
3. Soldiers must change overgarments within 24 hours of being contaminated in order to avoid seepage through suit.

CONSUMPTION:

1. When attacked with a liquid chemical agent (semipersistent nerve, persistent nerve, persistent blister), each surviving soldier will change the set he is wearing within 24 hours. With his second set on, he will avoid contaminating it and wear it until he accomplishes deliberate decon.
2. If not attacked with chemical agent, each soldier will change 1 set every 30 days.
3. Soldiers in chemical companies (DECON units only) will change 1 set per day while undergoing unit missions.

REFERENCES:

CTA 50-970
FM 3-5, 3-4, 3-100
CPT Melvin Betts, Project Officer for Overgarments, Material Logistics Systems Division (MLSD), DCD, USACMLS, AUTOVON 865-3877

Chemical Protective Boots
(8430-01-021-5978) & Gloves, 2.5 mil, (8415-00-753-6550)

INITIAL ISSUE: 2 sets per soldier (1 for wear, 1 for reserve)

USE: Protect the soldier from liquid chemical agents and chemical agent vapors.

ASSUMPTIONS:
1. Set will provide 14 days wear when no liquid chemical agents are splashed on the overgarment.
2. Replace overgarments, boots and gloves as one set.
3. Soldier wearing the suit is well trained and will avoid liquid contamination whenever possible.
4. Soldiers in chemical companies (Decon and Recon units only) use 1 overgarment per day.
5. Soldiers must change overgarments within 6 hours of being contaminated in order to avoid seepage through suit.

CONSUMPTION:
1. When attacked with a liquid chemical agent (SPN, PN, PX), each surviving soldier will change the set he is wearing within 6 hours. With his second set on, he will avoid contaminating it and wear it until he accomplishes complete decon. (2 sets/soldier per chem agent SPN, PN, PX attack).
2. If not attacked with chemical agent, each soldier will change 1 set every 14 days.
3. Soldiers in chemical companies (Decon and Recon units only) will change 1 set per day while undergoing unit missions.

REFERENCES:
CTA 50-970
TM 10-277
CPT Melvin Betts, Project Officer for Overgarments, Materiel Logistics System Development Div (MLSD), USACMLS Feb 84, AUTOVON 865-3877.

Chemical Protective Gloves, 14 mil, (8415-01-138-2501) and 7 mil (845-01-138-2497)

INITIAL ISSUE: 2 sets per soldier (1 for wear, 1 for reserve) as designated by Commanders.

ASSUMPTIONS:
1. Set will provide one day wear for both 7 mil and 14 mil gloves when not contaminated by chemical agent.
2. 7 mil golves are worn by hospital personnel and key punch operators.
3. Commanders designate what percentage of personnel are to wear 23 mil gloves. The remainder wear 14 mil gloves (or 7 mil gloves if they are assigned to hospital units.

CONSUMPTION:
1. When attacked, each soldier changes the set he is wearing within 6 hours.
2. If there is no attack, each soldier changes gloves daily.
3. For the purposes of this study, the percentage of troops wearing 25 mil gloves is set at 50%.

REFERENCES: CPT Ronald Levy, USACMLS, Jan 86.

Hoods, M5 (4240-00-860-8987), M7 (4240-00-021-8695) and M6A2 (4240--00-999-0420)

INITIAL ISSUE: M5 2 per M25 series protective mask (LIN M10936)
M7 2 per M24 series protective mask (LIN M1621)
M6A2 2 per M17 series protective mask (LIN M11895)

USE: To cover and protect the wearer's head and neck against chemical or biological agent vapor/aerosol or droplets.

ASSUMPTIONS: 1. The hood is only contaminated from a SPN, PN, or PX attack.
2. The hood is changed only during restoration (complete) decon (personnel).

CONSUMPTION: Per FM 3-5, the hood is only changed when personnel undergo complete decontamination, which would occur only during the restoration phase. This should be done once per chemical attack. Therefore units will consume 1 hood per individual (survivor) per complete decontamination operations.

Also, when a new mask is issued, a hood will have to be issued along with it. This replacement is directly tied to the Wartime Active Replacement Factor (WARF) found in SB 710-1-1 for each type mask.

REFERENCES: FM 3-5 (draft)
SB 710-1-1
USACMLS Doctrine Office (CPT LaJoie)

Winterization Kit, M3 & Winterization Kit, M4 (4240-00-066-0181 & 4240-00-065-0319)

INITIAL ISSUE: The M3 is issued 1 per M24/25 Series Protective Mask where ambient air temperature is below 32°F. The M4 is issued 1 per M17 Series Protective Mask where ambient air temperature is below 32°F.

USE: The M3 winterization kit is used when the temperature is below 20°F. The M4 is used when the temperature is below -20°F.

ASSUMPTIONS/FACTS:

1. Winterization kit is not consumed through use. (TM 3-4240-279-10, TM 3-4240-279-20&P, TM 3-4240-280-10, TM 3-4240-280-20&P)

2. Every new mask issued/procured/replaced will require a winterization kit.

CONSUMPTION: None - Nonconsumable items.

Wartime Active Replacement Factor (WARF) - For M3, it should be the same as the M24 and M25 series protective masks (.0798). For the M4, it should be the same as the M17 series protective mask (also .0798).

REFERENCES: TM 3-4240-279-10
TM 3-4240-279-20&P
SB 710-1-1
TM 3-4240-280-10
TM 3-4240-280-20&P
FM 3-8
CTA 50-970

M8 Chemical Agent Detector Paper (6665-00-050-8529)

INITIAL ISSUE: 1 book per individual.

USE: To detect the presence of V series (Nerve), G series (Nerve) and H series (Blister) liquid chemical agents.

ASSUMPTIONS: Used only when a chemical attack occurs (NPB, NPN, SPN, PN, PX)
Each book has 25 perforated sheets for a total of 50 tickets.

CONSUMPTION: Each soldier will consume 6 tickets per chemical agent attack, and each vehicle operator will use an additional 6 tickets to check his vehicle for the following agents (NPB, NPN, SPN, PN, PX). The following is a detailed breakout:

1 ticket to check weapon
1 ticket to check LBE
4 tickets to check immediate surroundings
6 tickets to check vehicle

Each unit will consume 1 book of M8 paper per vehicle decontaminated after a SPN, PN, or PX attack.

REFERENCES: FM 21-40
TM 3-6665-205-1011-1012
CPT Klewin and CPT Levy, C&S Div, DCD, USACMLS, Mar 84
COAC 3-83, 29 Feb 84
CTA 50-970

M9 Chemical Agent Detector Paper (6665-01-049-8482)

INITIAL ISSUE: 1 roll per individual
1 roll per major end item (MEI) exposed to direct chemical agent attack

USE: To show the presence of liquid chemical agent (as a badge to record the impact of liquid agent droplets).

ASSUMPTIONS:

1. Personnel: 3 strips per individual
18 inches per strip
Total of 54 inches per individual (3 strips x 18 inches)
Each strip lasts 3 days, Fair Wear and Tear (FWT)
All personnel will maintain MOPP 1 throughout conflict

2. Major End Item (MEI): 5 strips per MEI
Each strip lasts 4 days (best guess, different from personnel)
Strips will be contaminated with agent in a uniform distribution
Strips changed after vehicle washdown (sustainment and restoration phases)
90% probability of detection needed per square meter

3. M9 Paper: 30 ft per roll or 360 inches long
5.1 cm wide per strip

CONSUMPTION:

1. Personnel: 6.7 changes per roll or 20 days per roll per individual. An additional 54 inches per individual will be used per MOPP gear exchange (sustainment/restoration) after a liquid chemical agent attack.

Calculations:

$\frac{360 \text{ inches per roll}}{54 \text{ inches per indiv}}$ = 6.7 per individual per roll (uses)

6.7 per individual per roll x 3 days per individual =
20 days per roll per individual

2. Major End Item: 7 changes per roll or 28 day per roll per MEI
An additional 50 inches per MEI will be used after vehicle washdown (sustainment/restoration)

M9 Paper (Continued)

Calculations:

The following formula was used to compute the 90% probability of capture of agent on M9 paper.

$$P = 1-(1-A)^n$$

n = Average drops per square meter = 188

$$A = \frac{\text{square meter of M9}}{\text{1 square meter}}$$

$$L = \text{Length of M9 paper} = \frac{A(m^2 \text{ of M9})}{.051\text{m (width of M9)}}$$

L = 9.4 inches or 10 inches (rounded up)
5 strips per MEI x 10 inches per strip = 50 inches per MEI
360 inches per roll = 7 changes per MEI
50 inches per MEI
7 changes per MEI per roll x 4 days per change = 28 days per roll per MEI

REFERENCES: CTA 50-970, BOI
TM 3-6605-311-10, April 82
Mr. Herb Cox (formula) Det & Alarms, Br, MLSD, USACMLS
Mr. Steve Tackett, RAM, MLSD, USACMSL, Jan 84

A Study of the Ability of LAD Device to detect face contamination (U)
Probability of capture by flat surface (formula) (U)

US Army Combat Developments Command
Study on Chemical, Biological and Radiological - 75 (U)
Annexes F, G, and H Volume III, September 1968 page F-II-29
(Detection Probabilities)

M11 Decontamination Apparatus (4230-00-720-1618)

INITIAL ISSUE: Per the following CTA 50-909 change:

ITEM	QUANTITY
An/TSQ-73 Bn - LIN A 26868	3
An/TSQ-73 Group - LIN A 26874	3
CFV LIN C76335 (Armor units only)	4
Fire Fighting Equip, Trk Mtd, Pumper LIN H 56391	1
Fire Fighting Equip, Trk Mtd, Brush LIN H 56528	1
Fire Fighting Equip, Trk Mtd, Structural LIN H 56802	1
Generator Set, Trl Mtd, 15-500 KW	1
Generator Set, Trl Mtd, 750KW & above	2
Gun, ADA, SP, 40 mm LIN 96820	3
HAWK missile system	3
ITV LIN E56896 (Armor units only)	3
Main battle tank	3
M113 APC LIN D12087 (Armor units only)	3
M577 CCP LIN D11538 (Armor units only)	3
PATRIOT missile system	3
Radar Set, AN/MPQ-49 FAAR LIN Q 16045	3
Radar Set, AN/TPQ-32 FAAR LIN Q 17131	3
Recovery Vehicle, M88 LIN R50681 (Armor units only)	3
ROLAND missile system	3
Tractor, Whl Ind, DS1, w/Backhoe Loader LIN W 91074	1
Trk, Van, Shop 2 1/2 ton 6x6 w/w LIN X 62477 (Engineer units only)	1
Trk, Van, Shop 2 1/2 ton 6x6 LIN X62340 (Engineer units only)	1

USE: To apply/spray DS-2 to vehicles.

ASSUMPTIONS: 1. When vehicle is destroyed, M11's are also destroyed.
2. Replacement vehicles do not have M11's on them when arriving.

CONSUMPTION: M11's are not consumed through a chemical agent attack, however as replacement vehicles enter theater, the M11's must be added to them. Therefore the replacement factor for the M11's are tied to the replacement factors for the vehicles to which they are assigned.

REFERENCES: CTA 50-909
USACMLS Doctrine Office
TM 3-4230-204-12&P

Nitrogen Cylinder (4230-00-775-7541)

INITIAL ISSUE: 4 per M11 Decontamination Apparatus

USE: To pressurize M11 and dispense DS-2

ASSUMPTIONS:

1. 1 nitrogen cylinder will dispense 1 1/3 qts of DS-2 from M11 in summer.

2. 2 nitrogen cylinders will dispense 1 1/3 qts of DS-2 from M11 in winter.

CONSUMPTION:

1. 1 nitrogen cylinder per 1 1/3 qt can of DS-2 consumed in summer.

2. 2 nitrogen cylinders per 1 1/3 qt can of DS-2 consumed in winter.

REFERENCE: TM 3-4230-204-12&P

DS-2, 1 1/3 qt can (6850-00-753-4827)

INITIAL ISSUE: 2 cans per M11 Decon Apparatus

USE: To decontaminate equipment that has been contaminated with liquid blister or nerve agents.

ASSUMPTIONS: Use for only SPN, PN, or PX attacks
Each vehicle or piece of equipment requires 2 cans for operator spraydown.

CONSUMPTION: After a chemical attack (SPN, PN, PX) a unit authorized M11's will conduct an operator spraydown of appropriate portions or areas of all contaminated vehicles. The spraydown will be done using 2 cans of DS-2.

REFERENCES: TM 3-220
FM 3-5 (draft)
TM 3-4230-209-10

DS-2, 5-Gallon Pail (6850-00-753-4870)

INITIAL ISSUE: Two per company size element 10 per M12A1 Power Driven Decontamination apparatus.

USE: Operator Spray Down, Hasty, and Deliberate DECON operations

ASSUMPTIONS: None

CONSUMPTION: Contaminated units will use the 5-gallon pails of DS-2 to assist in DECON operations. Therefore, when a unit authorized the 2 ea 5-gallon pails is attacked with a chemical agent (semipersistent nerve, persistent nerve, persistent blister), the unit will consume 2 ea 5-gallon pails per hasty DECON operations. When this same contaminated unit undergoes deliberate DECON operations, it will use 1 ea 5-gallon pail per vehicle.

Operator Spray Down/Hasty:

2 ea - 5 gal pails per company

Deliberate:

1 ea - 5 gal pail per vehicle contaminated
5 ea - 5 gal pails to close DECON site

REFERENCES: FM 3-5
FM-3-4

M13 Decontamination Apparatus, Portable (DAP) Accessories (4230-01-133-4134)

INITIAL ISSUE: 1 per major end item, except those major end items authorized M11 DECON Apparatus, See MIL DECON APP., (For operator spray down only)

USE: To apply DS-2 to major end items.

ASSUMPTIONS:

1. The M13 DAP has two consumable components, the brush (4230-01-136-8892) and the 14 liter container of DS-2 (4230-01-136-8888) (Fluid container, filled).

2. Use only for Semipersistent Nerve, Persistent Nerve, Persistent Blister Attacks.

3. One Brush will last for 14 liters of DS-2.

4. Change brush and 14 liter container at the same time.

CONSUMPTION: The 14 liters of DS-2 is enough to do the operator spraydown (3 liters per spraydown) 4 times. The 3 liters for operator spraydown is a replacement of the two 1 1/3 qt cans carried for the M11 DECON Apparatus. Therefore, every 4 times a vehicle is contaminated with liquid agent. (Semipersistent Nerve, Persistent Nerve, Persistent Blister) there will be a consumption of 1 brush and 1 14-liter can of DS-2 per authorized M13 DAP.

The M13 DAP will require replacement as a whole each time a replacement major end item is brought into theater.

REFERENCES: FM 3-5, (pp. 4-6, 7-4, E-6)

NBC Marking Set (9905-12-124-5955)

INITIAL ISSUE: Chemical Company 14 ea
Platoon Sized element 2 ea

USE: Marking contaminated areas

a. Decon Site

b. Area of attack

ASSUMPTIONS: Markers are expendable (FM 21-40)
USE only for SPN, PN, PX
Spacing between markers is 100m (DPG Document # DPG-FR-81-302)
Decon site is 2 km X 1 km (FM 3-5, USACMLS Doctrine Office)
Decon mission lasts 2 days (2 ea 10 hr days, ROC XM17 LDS)
20 of each type marker per kit (TM 3-9905-001-10)

CONSUMPTION. DECON SITES: Per FM 3-5 and USACMLS Doctrine Office, a restoration decon site is expected to be approximately 2 km X 1 km. This would give a perimeter to be marked of 6 km. Putting a marker every 100 meters would require 60 markers or 3 kits. This decon site is marked only by chemical platoons and the same site is used for 2 days. Therefore, each Cml platoon would consume 3 kits every 2 days.

AREAS OF ATTACK: Each unit attacked with a SPN, PN, or PX agent would have to mark its area. Placing markers every 100 m, divide the perimeter of the attack area (different for each type agent and delivery system) by 100 to find the # of markers required. Divide this by 20 to find the number of kits required per chemical attack.

REFERENCES:

TM 3-9905-001-10
FM 3-5 (draft)
Final Report, Technical Feasibility Test of German NBC
Contamination Marking Set (DPG Document #DPG-FR-81-302)
Required Operational Capability Document (ROC), XM17 LDS

M256 Chemical Agent Detector Kit (6665-01-016-8399)

INITIAL ISSUE: 1 per squad in CAT I & CAT II Units
2 per platoon in CAT III Units

USE:

a. To detect and identify chemical agent attacks

b. To identify chemical agents in an NBC Survey

c. To aid in initiating unmasking procedure

d. To aid unit advance party in selecting an area free of NBC contamination.

ASSUMPTIONS: 12 cards per kit
Chemical attack duration stated in para 3, basic document.

CONSUMPTION: M256 kits are consumed during 3 basic types of combat operations.

1. A unit will use M256 kits during a move to a new location. The unit advance party will check the area for chemical contamination utilizing 4 detector cards per move (experience).

2. A unit will use M256 kits when attacked with chemcial agents to detect and identify agents used. Initial Use: When attacked, everyone with a M256 kit will expend 1 card. The initial expenditure will be N cards, where N = number of kits on hand based on issue data above. Subsequent Use: Due to the varied persistency of different chemical agents, they will consume different amounts of detector cards during their duration. The following is a breakout of each type by agent attack:

a. Nonpersistent Blood (NPB). For an NPB agent attack lasting 15 min - 1 hr, a unit will consume 2 more detector cards, (including unmasking procedures) per platoon. This equates to [2 x P = number of cards consumed] per NPB attack, where 2 = the number of detector cards, P = the number of platoons using the 256 kit.

b. Nonpersistent Nerve (NPN). For an NPN agent attack a unit will consume 1 card per platoon per hour of duration lasting up to a total of 3 hours of possible duration. This equates to [1 x P x 3 = number of cards consumed] per NPN, where 1 = the number of detector cards, P = the number of platoons using the 256 kit, and 3 = the total number of hours of possible agent duration.

c. Semipersistent Nerve (SPN). For an SPN agent attack a unit will consume 1 card per platoon per hour of duration lasting up to a total of 8 hours of possible duration. This equates to [1 x P x 8 = number of cards consumed] per SPN attack, where 1 = the number of detector cards, P = the number of platoons using the 256 kit, and 8 = the total number of hours of possible agent duration.

d. Persistent Nerve (PN). For a PN agent attack a unit will consume 1 card per platoon per 4 hours of duration until it moves from the area or until a total of 48 hours of possible agent duration has elapsed. This equates to [1 x P x H/4 = number of cards consumed] per NPN attack, where 1 = the number of detector cards, P = the number of platoons using the 256 kit, H = the number of hours the unit remains in the area up to a maximum of 48 hours.

e. Persistent Blister (PX). Same as Persistent Nerve (PN).

UNMASKING PROCEDURES: 2 Cards per company for NPN, SPN, PN, PX.

3. NBC Recon assets within the Cavalry Squardron of the Heavy Divisions will do chemical surveys. The Corps is allocated a recon company of 3 platoons. There is 1 recon squad per platoon. One platoon supports a brigade size area, 3 platoons per company. Each recon squad will do 1 survey per day when in a chemical environment. A survey will consist of 10 points. The squad will drive jeeps w/M8 alarms until the alarm sounds. Each jeep will then expend 1 card at that point. The jeeps will then exit the contamination and expend 1 card (per squad) to insure they are clear of the area for a squad total of 4 cards per point. The team will survey 10 points in this manner. The total per day per squad will be 40 cards for a survey. The squad will also conduct 1 decon site survey expending 2 cards per day. The grand total will be 42 cards/NBC recon squad per day.

REFERENCES: FM 3-87
TM 3-6665-307-10

Battery, BA 3517/U, Dry, 36V (6135-00-450-3528)

INITIAL ISSUE: 1 per M8 Automatic Chemical Agent Alarm (LIN A32060)

USE: Power source for M8 Automatic Chemical Agent Alarm.

ASSUMPTIONS: M8 Alarms run continuously on battery power
1 mission equals 12 hours

CONSUMPTION:

MONTH	# MISSIONS
JAN	1
FEB	1
MAR	2
APR	2
MAY	3
JUN	5
JUL	5
AUG	5
SEP	4
OCT	3
NOV	1
DEC	1

The # of missions is based upon the chart on page 1-10, TM 3-6665-225-12. The average daily temperature for each month was computed from: LTR, ATCD-TEC, HQ, TRADOC, SUBJECT: European Weather Data, dtd 27 Jun 77.

REFERENCES: TM 3-6665-225-12
Ltr, ATCD-TEC, HQ, TRADOC, Subject: European Weather Data, dtd 27 Jun 77.

M229 Chemical Agent Alarm Refill Kit (6665-00-859-2214)

INITIAL ISSUE: 1 kit per M8 Automatic Chemical Agent Alarm (LIN A32060)

USE: To replace the consumable materials for sustaining the operations of the M43 detector unit of the M8 automatic chemical agent alarm.

ASSUMPTIONS: M8 Alarm runs continuously

Alarm is serviced every 12 hrs (all units except NBC Recon Squads)

1 M229 kit lasts 15 days (all units except NBC Recon Squads)

CONSUMPTION: 1 M229 kit per 15 days per M8 alarm (except NBC Recon Squads)

NBC Recon Squads - a recon squad will conduct 1 chem survey per day, each survey will consist of 10 points. While conducting a survey, the squad will move to a point until the alarm sounds. It will then leave the area, reset the alarm, and enter from another way. (Per FM 3-87). This will cause the alarm to be serviced 10 times per day. If each kit contains components to service an alarm 30 times, a kit will last 3 days per alarm for an NBC Recon Squad.

REFERENCES: FM 3-87
TM 3-6665-225-12

M7A1 Gas Particulate Filter Unit (4240-00-203-3999) (LIN H 50418)
M12A1 Gas Filter (4240-00-289-7978)
M13 Particulate Filter (4240-00-368-6291)

INITIAL ISSUE: 10 ea per General Hospital, 1000 bed
3 ea per Station Hospital, 300 bed
5 ea per Station Hospital, 500 bed
4 ea per Evacuation Hospital, Surgical Service
1 ea M12A1 Gas Filter per M7A1
1 ea M13 Particulate filter per M7A1

USE: To remove toxic chemical and biological agents from contaminated air and supply purified air to six or fewer bedridden hospital patients.

ASSUMPTIONS: 1. Change M12A1 and M13 filters as one set
2. No water damage or dust clogging of filters

CONSUMPTION: 1 set of filters every 30 days, or once after every blood agent attack.

REFERENCES: FM 3-4, NBC Protection

M8A3 Gas Particulate Filter Unit (4240-00-853-3201)
M12A1 Gas Filter (4240-00-289-7978)
M13 Particulate Filter (4240-00-368-6291)

INITIAL ISSUE: 1 M8A3 GPFU per M551 Armored Assault Vehicle (LIN A93125)
1 M8A3 GPFU per M60/M60A1 Tank Chassis Bridge Launcher (LIN L43664)

1 M8A3 GPFU per M132/M132A1 Flame Thrower Carrier (LIN D11621)
2 M8A3 GPFU per M578 Recovery Vehicle (LIN R50544)
2 M8A3 GPFU per M88 Recovery Vehicle (LIN R50681)

USE: To remove toxic chemical and biological agents from contaminated air and supply purified air through M25 or M25A1 tank masks to the crew members of armored vehicles.

ASSUMPTIONS: 1. Change M12A1 and M13 filters as 1 set
2. No water damage or dust clogging of filters

CONSUMPTION: 1 set of filters every 30 days, or once after every blood agent attack.

REFERENCES: FM 3-4, NBC Protection

M13A1 Gas Particulate Filter Unit (4240-00-964-9061)
M18 Gas Filter (4240-00-828-3952)
M19 Particulate Filter - (4240-00-866-1825)

INITIAL ISSUE: M13A1 GPFU, 1 per M728 CEV (LIN E56578), M60 Series Tank (LIN V13101, V 13270)
M18 Gas Filter - 2 per M13A1 GPFU
M19 Particulate Filter - 1 per M13A1 GPFU

USE: Provide filtered, heated air to vehicle occupants

ASSUMPTIONS: 1. M13A1 GPFU is installed in vehicles by the manufacturer
2. Change M18 & M19 Filters at the same time.
3. 1 M19 consumed per 2 M18 filters consumed

CONSUMPTION: 1 set of filters every 30 days, or once after every blood agent attack.

REFERENCES: FM 3-4, NBC Protection

M56/M59 Gas Particulate Filter Unit (GPFU)
Filter Set, Gas & Particulate (4240-01-067-5605)

INITIAL ISSUE: M56 GPFU - 1 per AN/TSQ-73 (LIN H48904)
M59 GPFU - 1 per Guided Missile System, Patriot (LIN Z27424)

USE: Provide filtered air for collective protection equipment

ASSUMPTIONS: 1. Gas and particulate filters are changed as a set.
2. No water damage or dust clogging of filters.

CONSUMPTION: 1 set of filters every 30 days, or once after every blood agent attack.

REFERENCES: FM 3-4, NBC Protection

GPFU, XM48M 100cfm
NSN 4240-01-161-3710

USE: Provide filtered air to vehicle occupants

INITIAL ISSUE: XM48 GPFU, 1 per M1E (LIN V77257)
M2 Bradley (LIN J81750), M247 Sgt York (G96572)

ASSUMPTIONS:
1. 200,000 maximum CT for GB attacks
2. 20,000 CT per GB attack
3. CK will cause greater consumption
4. Installed in vehicle by manufacturer

CONSUMPTIONS:
1. 1 per 10 attacks of GB (standard agents)
2. 1 per 6 attacks of CK
3. 1 per DS/GS maintenance performed

REFERENCE: Mr. Barry Hooks, DCD, MLSD, USACMLS, Oct 85
FM 3-4, NBC Protection

M272 Water Test Kit
NSN 0005-01-134-0885

INITIAL ISSUE: 0.03 per 1000 individuals per month as needed
per medical surveillance team
2 kits per Reconnaissance Team (NBC)
per water point team

USE: To detect and identify dangerous levels of common CW agents AC, HD, L, G & V series

ASSUMPTIONS: 20 minutes per test
25 test per kit per agent
1 operator per kit

CONSUMPTION: Water Point Teams (WP)
1 test per day per MOPP 1
1 test per 12 hours per MOPP 2
1 test per 6 hours per MOPP 3
1 test per 1 hour per MOPP 4

Medical Surveillance Team
2 test per potable water source per chemical agent attack (i.e., water buffalo, water truck)
1 test per verification of water point

NBC Reconnaissance
1 test per area recon if water source is encountered

NBC Decontamination Units
1 test per Recon for Decon Site
1 test per hour per Decon operation

REFERENCES:

1. TM 3-6665-319-10, June 1983, Advance Copy
2. Phone Conversation - Mr. A. Silvestri, CRDC DRSMC-CLC-C(A) Feb 84, ATV 584-3915
3. Phone Conversation - Maj McIlvater, QM School, ATSM-CSM, Feb 84, ATV 687-1764
4. Draft O&O Plan Water Quality Analysis Set Purification (WQAS-P) ATSM-CDM QM School, 3 Jan 1984, Page 3 (Copy MLSD)
4. Correspondence - Mr. Silvestri, CRDC, Feb 28, 1984, Copy of Letter Requirement (LR) XM272 Water Test Kit.

Nerve Agent Antidote Kit, Mark I (6505-01-140-6455)

INITIAL ISSUE: Mark I, 3 per Individual Soldier

USE: For nerve agent first aid. The individual soldier will carry the auto injector on their person or in the protective mask carrier. Upon experiencing symptoms of nerve agent poisoning, the soldier or his buddy would administer the autoinjectors as perscribed, i.e., one each as simultaneously as possible with atropine being first then followed at 15 minute intervals two additional times if symptoms persist or worsen.

ASSUMPTIONS:

1. The Mark I consists of two auto injectors clipped together one of which will carry atropine 300 mg/ml, 2ml, and other Pralidoxime chloride (2 Pam C1 2 mg/ml, 1 ml.)

2. Mild cases may require only three Mark I's issued to the soldier with severe cases requiring more than 20 atropine injectors and seven 2 Pam C1.

3. Individual issues of separate Atropine and 2 Pam chloride are carried as follows:

Basis of Issue for	Atropine	2 Pam C1	Mark I
Individual Soldier	0	0	3
Aid man	10	0	0
Ground Ambulance	60	15	0
Air Ambulance	24	6	0
Medical Equipment Set	1000	230	0

4. Not all nerve agent casualties will live, but that all will be administered their total allotted quantity of Mark I injectors.

CONSUMPTION: Per FM 21-40/change #3, 1 per individual nerve agent casualty every 15 minutes up to a maximum of 3

3 per replacement of all nerve agent casualties that return to duty.

REFERENCES: FM 21-40

MAJ Legg, AHS, Materiel System Div, Combat Development Letter, 21 Feb 84, AHS to USACMLS, SUBJECT: WRF for CDE.

Pralidoxime Chloride Injection 300mg/ml, 2ml
NSN 6506-01-125-3248

USE: Pralidoxime Chloride (2 Pam Cl) is an oxime, which increases the effectiveness of drug therapy in poisoning by some, but not all cholinesterase inhibitors (nerve agents). Unlike atropine, it acts by reactivating the inhibited enzyme at nicotinic as well as muscarinic sites and therefore relieves the skeletal neuromuscular block.

INITIAL ISSUE: 15 per Ground Ambulance, 6 per Air Ambulance, 230 per Medical Equipment Set (MES)

ASSUMPTIONS:

1. This item is separate from Mark I.

2. Each 2 ml injection is approximately equal to 1 hour of medication.

3. Maximum number of injections that can be given to any one individual is 4 each separate from the three (3) initially given as part of the Mark I

CONSUMPTION: 4 per severe nerve agent casualty
2 per moderate nerve agent casualty

REFERENCES: Ltr, AHS, SUBJECT: WRF for CDE, 21 Feb 84.
Phone Conversation - MAJ Legg, DCD, AHS, 8 Mar 84.
Phone Conversation - Dr. Mosebar, DCD, AHS, 13 Mar 84.

Diazepam Injection USP Syringe Needle Unit 5mg/ml, 2ml
NSN 6505-00-137-5891

USE: Diazepam is used as an anticonvulsant as well as a minor tranquilizer. Moderate to severe doses of nerve agent may cause seizures, the greater the dose of nerve agent, the more promptly the seizures. Uncontrolled seizures in a nerve agent casualty usually equates with death.

INITIAL ISSUE: 60 Syringes per Medical Equipment Set (MES)
Basis of Issue (BOI) per MES (See below)

ASSUMPTIONS:

1. Given to moderate and severe nerve agent casualties

2. Maximum number of injections that may be given to any one individual is 3 ea.

3. Basis of Issue for MES, for each Chemical Agent Patient Treatment:

Battalion Aid Station (BAS)	2
Clearing Station	5
Mobile Army Surgical Hospital (MASH)	2
Combat Support Hospital (CSM)	5
Evacuation Hospital (EVAC)	8
Convalescent Center	1
Field Hospital HU (100-Bed)	2
200-Bed Station Hospital	5
300-Bed Station Hospital	5
500-Bed Station Hospital	5
1000-Bed Station Hospital	5
Team OA Dispensary Detachment	2
Team OB General Dispensary	3
Team OC General Dispensary	5

CONSUMPTION: 1 1/2 injections per severe nerve agent casualty.
1 injection per moderate nerve agent casualty.

REFERENCES: Ltr, DCD, ASH, SUBJECT: WRF for CDE, 21 Feb 84.
Phone Conversation - MAJ Legg, DCD, AHS, 8 Mar 84.
Phone Conservation - Dr. Mosebar, DCD, AHS, 13 Mar 84.

Appendix C

TACWAR CHEMICAL POST-PROCESSOR

TACWAR CHEMICAL POSTPROCESSOR

PURPOSE: ONE TIME STUDY OF EFFECTS OF CHEMICAL WARFARE ON BLUE CHEMICAL DEFENSE EQUIPMENT.

GENERAL DESIGN:

TACWAR PRODUCES VARIOUS INFORMATION FROM A CHEMICAL RUN. THE POSTPROCESSOR USES THIS INFORMATION, ALONG WITH INPUT DATA TO THE POSTPROCESSOR, TO CALCULATE VARIOUS EFFECTS BASED ON THE PAPER ENTITLED, "TACTICAL DECISION RULES (USAGE RATES) FOR CHEMICAL DEFENSE EQUIPMENT (CDE) IN SUPPORT OF WARTIME REPLACEMENT FACTORS STUDY."

TACWAR OUTPUT:

THE TACWAR OUTPUT CONSISTS OF 132-CHARACTER RECORDS IN WHICH THE FIRST 7 PIECES OF DATA ARE THE SAME FOR EACH RECORD, INDEPENDENT OF THE RECORD TYPE. THE FOLLOWING DATA POSITIONS ARE RESERVED AND WRITTEN OUT IF AVAILABLE:

Number	Code	Cycle	Sector	Mission	Target Type	Type Agent
Num	' '	ICYCLE	IS	I or IUN	KITC	IAGTP
I3	2A4	I3	I1	I3	I1	I1

Note: IAGTP = IMTYPE(IWLKA)

SEE TABLE 1 FOR THE LIST OF RECORD TYPES. SEVERAL HEADER RECORDS PRECEDE THE NUMBERED RECORDS.

1 TACWAR CHEMICAL HISTORY FILE FOR A (NCYCLE) CYCLE RUN EXECUTED ON
(DATE)

2. DESCRIPTION: (DESC)

3. VALUES FOR TACWAR VARIABLES :MCYCLE,NCYCLE,NS,NFCT(1),NSSM(1), NW(1),NT(1),NSU(1),NSPT,NCTY
WHERE MCYCLE = STARTING CYCLE
NCYCLE = ENDING CYCLE
NCTY = NUMBER OF BLUE COUNTRIES

4.-7. VALUES FOR ADIST(IS,IC) = DISTRIBUTION OF DIVISIONS IN SECTOR IS BY COUNTRY.

FORMATS:

```
FORMAT(' TACWAR CHEMICAL HISTORY FILE FOR A ',I3,
& ' CYCLE RUN EXECUTED ON ',A10,/,' DESCRIPTION:',5A4)
FORMAT(10I10)
FORMAT(1X,8E13.7)
```

SEE ANNEX A FOR A DETAILED DESCRIPTION OF THE TACWAR OUTPUT RECORDS.

TABLE C-1

RECORD TYPES PRODUCED FROM TACWAR FOR THE CHEMICAL POSTPROCESSOR

NUMBER	CODE
1	LOCATION
2	WEAPON
3	TARGET
4	PARAMS
5	UNIT PLE
6	UNITAREA
7	UNIT WPN
8	UNIT TRK
9	AB LOSS
10	SN LOSS
11	SUP INV
12	SSM LOSS
13	PORTLOSS
14	CU LOSS
15	TA LOSS
16	DIV LOSS
17	BEG REP
18	BEG RPCZ
19	DIV DATA
20	DIV DIST
21	NC PLE
22	SSM PLE
23	HE PLE
24	END REP
25	END RPCZ
26	CFEBA
27	DIV MOPP

THE FOLLOWING DATA IS INPUT TO TACWAR WHEN A POSTPROCESSOR FILE IS DESIRED:

ICHEM-- = 1 TO SELECT OPTION TO PRODUCE OUTPUT FOR THE POSTPROCESSOR,
= 0 TO SUPPRESS PRODUCTION

DESC(5)-- 20 CHARACTER RUN DESCRIPTION

POSTPROCESSOR:

TACWAR SUBROUTINES INP AND INPEX HAVE BEEN INCORPORATED INTO THE POSTPROCESSOR TO PROCESS THE INPUT DATA FOR THE POSTPROCESSOR. COMFIX IS BE USED TO CREATE THE COMMON BLOCKS AND THE IVARQ AND IVARQA DATA STATEMENTS.

SEVERAL PROCESSING ROUTINES PERFORM THE CALCULATIONS TO PRODUCE THE DESIRED RESULTS. AN EXECUTIVE ROUTINE CONTROLS THE PROCESSING OF THE SUBROUTINES. THE EXECUTIVE ALSO PRINTS A HEADER FOR THE OUTPUT REPORT. RECORD PROCESSING UTILITY ROUTINES HAVE BEEN DEVELOPED TO MAKE DEVELOPMENT OF THE POST PROCESSOR CODE EASIER.

THE COMMON BLOCKS WHICH ARE USED ARE AS FOLLOWS:

BLANK - USER INPUT TO POST PROCESSOR
TWCOM - INPUT DATA FROM TACWAR FILE, INCLUDING INDEXES
WKCOM1 - WORKING COMMON BLOCK

THE OUTPUT FROM THE POST PROCESSOR IS SIMPLE. THE OUTPUT IS LABELED BY THE WV NUMBER, AND PROVIDES WORDS AND VALUES BY SECTOR AND COUNTRY FOR THE DESIRED CALCULATION. WHERE POSSIBLE, SUPPORTING DATA IS ALSO PRINTED OUT FOLLOWING THE CALCULATION RESULTS. THE RESULTS ARE PRINTED IN SECTIONS. THE FIRST COVERS EQUIPMENT REQUIREMENTS BASED ON AVERAGES OVER THE ENTIRE LENGTH OF THE BATTLE. THE SUBSEQUENT SECTIONS COVER EACH FIFTEEN DAYS OF BATTLE, USING AVERAGES FOR THOSE DAYS OF BATTLE.

SEE ANNEX B FOR ADDITIONAL INFORMATION ON THE CALCULATIONS.

ANNEX A

TACWAR OUTPUT FILE FOR POSTPROCESSOR

FOR ALL RECORDS WHICH USE THEM:

NUM = RECORD NUMBER
CODE = CHARACTER RECORD IDENTIFIER
ICYCLE = CYCLE NUMBER
IS = SECTOR NUMBER
I OR IUN = MISSION NUMBER
KITC = TARGET TYPE
1 = DIVISION IN BATTLEFIELD OR IN REAR ASSEMBLY
2 = AIRBASE
3 = SUPPLY NODES
4 = SSM SITE
5 = PORTS
6 = DIVISIONS IN REAR IN TRANSIT
7 = HIGHER ECHELON UNITS

IAGTP OR
IMTYPE(IA) = AGENT TYPE
1 = VAPOR, 2 = SEMI-PERSISTENT, 3 = LIQUID

1. **LOCATION RECORD**
CODE = 'LOCATION'
NUM, CODE,ICYCLE,IS,NNIWAS(2)
FORMAT(I3,'LOCATION',I3,I1,3X,1X,I10)

NNIWAS(2) = NUMBER OF RED ATTACK MISSIONS AGAINST BLUE

2. **ATTACK WEAPON DESCRIPTION RECORD**
CODE = 'WEAPON'
NUM,CODE,ICYCLE,IS,I,KITC,IMTYPE(IA),INDEX,IWC,IWS,IPOS,IA,K
FORMAT(I3,'WEAPON ',I3,I1,I3,2I1,I10,5I5)

INDEX = PACKED WEAPON SYSTEM DESCRIPTION
IWC = WEAPON CATEGORY
IWS = WEAPON SYSTEM
IPOS = FIRING POSITION INDEX
IA = AGENT INDEX
K = DISSEMINATION MODE INDEX

3. **TARGET PARAMETERS RECORD**
CODE='TARGET'
NUM,CODE,ICYCLE,IS,I,KITC,IMTYPE(IA),IWLBT,IWLTLO,IWLTZN,IWLCOT,IWLID,
IWLNCR,IWLKA,IWLDM
FORMAT(I3,'TARGET ', I3,I1,I3,2I1,8I5)

IWLBT = NUMBER OF TARGETS ATTACKED ON THIS FIRE MISSION
AIRFIELD
0 = RUNWAY
1-6 = PARKING AREA NUMBER

IWLTLO = ITC TARGET CATEGORY (1=BATTLEFIELD, 2=REGION, 3=COMMZ)
IWLTZN = IF ITC = 1 (BATTLEFIELD) DIVISION ZONE OTHERWISE TARGET
SUBTYPE (ITYP) EXCEPT IF ISUB = 4 (DIVISION IN REAR) THEN IT IS SUBUNIT TYPE (ISU)
IWLCOT = IF ITC = 1 (BATTLEFIELD) IT IS SUBUNIT TYPE(ISU),
OTHERWISE TARGET TYPE (ISUB)
IWLID = TARGET IDENTIFICATION ID#, A/B#, SN#, PORT#, NO. OF SSMS, OR NO. OF HIGHER ECHELON UNITS (ID# = DS - LOCATION OF DIVISION IN SECTION--NOT DIVISION ID. SEE DEFINITION OF IDS IN ISUB/ITYP LIST.)
IWLNCR = NUMBER OF CHEMICAL ROUNDS FIRED
IWLKA = AGENT
IWLDM = DISSEMINATION MODE

4. **ATTACK PARAMETER RECORD**
CODE = 'PARAMS'
NUM,CODE,ICYCLE,IS,I,KITC,IMTYPE(IA),WLHOP,WLCEP,WLQAT,WLSPR,JTYPW
FORMAT(I3,'PARAMS ',I3,I1,I3,2I1,4E13.7,I5)

WLHOP = HEIGHT OF BURST
WLCEP = AIMING ERROR
WLQAT = WEIGHT OF AGENT/ROUND
WLSPR = SPRAY LINE LENGTH
JTYPN = MUNITION TYPE

NOTE: IN RECORDS 5, 6, 7, AND 8 THE UNIT VALUES ARE FOR EACH UNIT ATTACKED. THE CONTAMINATION VALUES AND THE RESULTING DIVISION VALUES INCLUDE RESULTS FROM ALL ATTACKED UNITS.

5. **DIVISION UNIT PERSONNEL EFFECTS RECORD**
CODE = 'UNIT PLE'
NUM,CODE,ICYCLE,IS,IUN,KITC,IAGTP,IWLKA,ID,ISU,IZ,ICN,IT,IWLTAR,TPSU,
TCSU,TFSU,TPPZN,TCZN,TFZN,TPDV
FORMAT(I3,'UNIT PLE',I3,I1,I3,3I1,I3,4I2,I5,7E13.7)
IWLKA = AGENT INDEX
ID = DIVISION ID
ISU = SUBUNIT TYPE
IZ = ZONE (0 FOR DIVISION IN REAR)
ICN = DIVISION COUNTRY
IT = DIVISION TYPE
IWLTAR = NUMBER OF TARGETS
TPSU = PERSONNEL IN SUBUNIT ATTACKED
TCSU = TOTAL CASUALTIES IN SUBUNIT ATTACKED
TFSU = TOTAL FATALITIES IN SUBUNIT ATTACKED
TPPZ = TOTAL ZONE PERSONNEL BEFORE ATTACK
TCZN = TOTAL ZONE CASUALTIES
TFZN = TOTAL ZONE FATALITIES
TPDV = TOTAL DIVISION PERSONNEL BEFORE ANY ATTACKS

6. **DIVISION UNIT AREA DESCRIPTION RECORD**
CODE = 'UNITAREA' DWID,DLEN,AOV
NUM,CODE,ICYCLE,IS,IUN,KITC,IAGTP,ID,ISU,IZ,ICN,IT,CALEN,CAWID,ZLEN,ZAREA
DWID,DLEN,AOV
FORMAT(I3,'UNITAREA',I3,I1,I3,2I1,I3,4I2,7E13.7)

ID = DIVISION ID

ISU = SUBUNIT TYPE
IZ = ZONE (0 FOR DIVISION IN REAR)
ICN = DIVISION COUNTRY
IT = DIVISION TYPE
CALEN = LENGTH OF CONTAMINATED AREA
CAWID = WIDTH OF CONTAMINATED AREA
ZLEN = ZONE LENGTH
ZAREA = ZONE AREA = ZLEN X DWID
DWID = DIVISION WIDTH
DLEN = DIVISION LENGTH
AOV = ZONE AREA COVERED

7 **DIVISION UNIT WEAPON CONTAMINATION RECORD**
CODE = 'UNIT WPN'
ONE RECORD FOR EACH WEAPON TYPE IW:
NUM,CODE,ICYCLE,IS,IUN,KITC,IAGTP,ID,IWLCT,ITLZN,ICN,IT,IWLTAR,IW,
OLDWPN, WDIV(IW,ID),WSU(IW),WZN(IW),WSUCN(IW),WZNCN(IW),CONEQ(ID,IW)
FORMAT(I3,'UNIT WPN',I3,I1,I3,2I1,I3,4I2,I5,I2,7E13.7)

ID = DIVISION ID
IWLCT = SUBUNIT TYPE ISU
ITLZN = ZONE (=0 FOR DIVISIONS IN REAR)
ICN = DIVISION COUNTRY
IT = DIVISION TYPE
IWLTAR = NUMBER OF TARGETS
IW = WEAPON TYPE
OLDWPN = NUMBER OF WEAPONS OF THIS TYPE BEFORE ATTACK
WDIV(IW,ID) = TOTAL DIVISON WEAPONS OF TYPE IW AFTER ATTACK
WSU(IW) = TOTAL SUBUNIT WEAPONS ATTACKED
WZN(IW) = TOTAL ZONE WEAPONS ATTACKED
WSUCN(IW) = SUBUNIT WEAPONS CONTAMINATED
WZNCN(IW) = ZONE WEAPONS CONTAMINATED
CONEQ(ID,IW) = TOTAL CONTAMINATED DIVISION WEAPONS OF TYPE IW UP TO NOW

8. **DIVISION UNIT TRUCK CONTAMINATION RECORD**
CODE = 'UNIT TRK'
NUM,CODE,ICYCLE,IS,IUN,KITC,IAGTP,ID,IWLCT,ITLZN,ICN,IT,IWLTAR,OLDTRK,
TDIV(ID),TRKSU,TRKZN,TKSUCN,TKZNCN,CONTRK(ID)
FORMAT(I3,'UNIT TRK',I3,I1,I3,2I1,I3,4I2,I5,7E13.7)

ID = DIVISION ID
IWLCT = SUBUNIT TYPE ISU
ITLZN = ZONE (=0 FOR DIVISIONS IN REAR)
ICN = DIVISION COUNTRY
IT = DIVISION TYPE
IWLTAR = NUMBER OF TARGETS
OLDTRK = NUMBER OF TRUCKS FOR THE DIVISION BEFORE THE ATTACK
TDIV(ID) = NUMBER OF DIVISION TRUCKS AFTER ATTACK
TRKSU = TOTAL SUBUNIT TRUCKS ATTACKED
TRKZN = TOTAL ZONE TRUCKS ATTACKED
TKSUCN = SUBUNIT TRUCKS CONTAMINATED
TKZNCN = ZONE TRUCKS CONTAMINATED
CONTRK(ID) = TOTAL DIVISION TRUCKS CONTAMINATED UP TO NOW

9. **AIRBASE CASUALTIES**
CODE = 'AB LOSS'
NUM,CODE,ICYCLE,KISS,IUN,KITC,IAGTP,IAB,IPA,ACTPAJ(IPA),BONEP,PMILC,BMILC
FORMAT(I3,'AB LOSS ',I3,I1,I3,2I1,2I3,4E13.7)

IAB = AIRBASE NUMBER
IPA = PARKING AREA NUMBER
ACTPAJ(IPA) = PERSONNEL ON TARGETED PARKING AREA
BONEP = PERSONNEL ON NON-TARGETED PARKING AREA
PMILC = CASUALTIES ON TARGETED PARKING AREA
BMILC = CASUALTIES ON NON-TARGETED PARKING AREAS

10. **SUPPLY NODE RESULTS**
CODE = 'SN LOSS'
NUM,CODE,ICYCLE,IS,IUN,KITC,IAGTP,ISN,PMILSN(ISN),TCSU,TFSU,COV,CALEN,
CAWID
FORMAT(I3,'SN LOSS ',I3,I1,I3,2I1,I3,6E13.7)

ISN = SUPPLY NODE NUMBER
PMILSN(ISN) = SUPPLY NODE PERSONNEL BEFORE ATTACK
TCSU = CASUALTIES
TFSU = FATALITIES
COV = FRACTION OF SUPPLIES CONTAMINATED
CALEN = LENGTH OF CONTAMINATED AREA
CAWID = WIDTH OF CONTAMINATED AREA
CAWID = WIDTH OF CONTAMINATED AREA

11. **SUPPLY INVENTORY**
CODE - 'SUP INV'
ONE RECORD FOR EACH SIDE BLUE COUNTRY IC:
NUM,CODE,ICYCLE,IS,IUN,KITC,IAGTP,ISN,IC,(SUPIN(ISN,ISPT,IC),ISPT=1,NSPT)
FORMAT(I3,'SUP INV ',I3,I1,I3,2I1,2I3,6E13.7)

ISN = SUPPLY NODE
IC = COUNTRY
SUPIN(ISN,ISPT,IC) = TYPE ISPT SUPPLIES AT NODE ISN FOR COUNTRY IC
BEFORE ATTACK.

12. **SURFACE TO SURFACE MISSLE RESULTS**
CODE = 'SSM LOSS'
NUM,CODE,ICYCLE,IS,IUN,KITC,IAGTP,IWLKA,ISM,IWLTAR,SSMMIL,TCSU,TFSU,
CALEN,CAWID,PMLSSM(ISM,IS,1),SSMAMT(ISM,IS,1)
FORMAT(I3,'SSM LOSS',I3,I1,I3,4I1,I5,7E13.7)

IWLKA = AGENT INDEX
ISM = SSM SITE
IWLTAR = NUMBER OF TARGETS
SSMMIL = MILITARY PERSONNEL AT ONE SITE BEFORE ATTACK
TCSU = CASUALTIES
TFSU = FATALITIES
CALEN = LENGTH OF CONTAMINATED AREA
CAWID = WIDTH OF CONTAMINATED AREA
PMLSSM(ISM,IS,1) = SSM PERSONNEL AFTER ATTACK
SSMAMT(ISM,IS,1) = NUMBER OF ISM SSM SITES IN SECTOR IS FOR SIDE 1

13. **PORT RESULTS**

CODE = 'PORTLOSS'
NUM,CODE,ICYCLE,IS,IUN,KITC,IAGTP,ISN,PRTPLE(IPORT),TCSU,TFSU,COV,TLEN, TWID,PRTCTN(IPORT)
FORMAT(I3,'PORTLOSS',I3,I1,I3,2I1,2I3,7E13.7)

IPORT = PORT NUMBER
ISN= ASSOCIATED SUPPLY NODE NUMBER
PRTPLE(IPORT) = PORT PERSONNEL BEFORE ATTACK
TCSU = CASUALTIES AT EACH SITE
TFSU = FATALITIES AT EACH SITE
COV= FRACTION OF PORT CONTAMINATED
CALEN = LENGTH OF CONTAMINATED AREA
CAWID = WIDTH OF CONTAMINATED AREA
PRTCTN(IPORT) = PORT CONTAMINATION BEFORE ATTACK

14. **CORPS UNITS LOSSES**

CODE = 'CU LOSS'
NUM,CODE,ICYCLE,IS,IUN,KITC,IAGTP,IWLKA,IFCT,IWLTAR,OLDAVG,TCSU,TFSU, COV,CALEN,CAWID,ECEAC(IFCT,IS,N),ECTAC(IFCT,IS,N)
FORMAT(I3,'CU LOSS ',I3,I1,I3,3I1,I2,I5,8E13.7)

IWLKA = AGENT INDEX
IFCT = FUNCTION TYPE
IWLTAR = NUMBER OF TARGETS
OLDAVG = ORIGINAL AVERAGE NUMBER OF PEOPLE
TCSU = CASUALTIES
TFSU = FATALITIES
COV = FRACTION OF TARGET COVERED FOR EQUIPMENT AND TRUCKS
CALEN = LENGTH OF CONTAMINATED AREA
CAWID = WIDTH OF CONTAMINATED AREA
ECEAC(IFCT,IS,N) = AVERAGE NUMBER OF EQUIPMENT IN UNIT IN SECTOR IS BEFORE ATTACK
ECTAC(IFCT,IS,N) = AVERAGE NUMBER OF TRUCKS IN UNIT IN SECTOR IS BEFORE ATTACK

15. **THEATER ARMY LOSSES**

CODE = 'TA LOSS'
NUM,CODE,ICYCLE,IS,IUN,KITC,IAGTP,IWLKA,IFCT,IWLTAR,OLDAVG,TCSU,TFSU, COV,CALEN,CAWID,EAEAC(IFCT,IS,N),EATAC(IFCT,IS,N)
FORMAT(I3,'TA LOSS ',I3,I1,I3,3I1,I2,I5,8E13.7)

IWLKA = AGENT INDEX
IFCT = FUNCTION TYPE
IWLTAR = NUMBER OF TARGETS
OLDAVG = ORIGINAL AVERAGE NUMBER OF PEOPLE
TCSU = CASUALTIES
TFSU = FATALITIES
COV = FRACTION OF TARGET COVERED FOR EQUIPMENT AND TRUCKS
CALEN = LENGTH OF CONTAMINATED AREA
CAWID= WIDTH OF CONTAMINATED AREA
EAEAC(IFCT,IS,N) = AVERAGE NUMBER OF EQUIPMENT IN UNIT SECTOR IS BEFORE ATTACK
EATAC(IFCT,IS,N) = AVERAGE NUMBER OF TRUCKS IN UNIT IN SECTOR IS BEFORE ATTACK

16. **TOTAL DIVISION CASUALTIES**
CODE = 'DIV LOSS'
NUM,CODE,ICYCLE,IS,ID,ICN,IT,JCHIPP(ID),PDIV(ID),TDCAS,SUM
FORMAT(I3,'DIV LOSS',I3,I1,3X,2X,I3,2I2,I5,3E13.7)

ID = DIVISION ID
ICN = DIVISION COUNTRY
IT = DIVISION TYPE
JCHIPP(ID) = DIVISION DEFENSIVE POSTURE FOR PREVIOUS AND CURRENT CHEMICAL SUBCYCLES(PACKED)
PDIV(ID) = DIVISION PERSONNEL BEFORE ATTACKS
TDCAS = TOTAL DIVISION CASUALTIES
SUM = TOTAL BONUS CASUALTIES

17. **BEGINNING BLUE PERSONNEL REPLACEMENTS FOR ALL EXCEPT DIVISIONS**
CODE = 'BEG REP'
NUM, CODE, ICYCLE, RPPAB(1),RPPSN(1),RPPSSM(1),RPPHE(1)
FORMAT(I3,'BEG REP ',I3,6X,4E13.7)

RPPAB(1) = REPLACEMENT POOL FOR AIRBASES
RPPSN(1) = REPLACEMENT POOL FOR SUPPLY NODES
RPPSSM(1) = REPLACEMENT POOL FOR SSM SITES
RPPHE(1) = REPLACEMENT POOL FOR HIGHER ECHELON UNITS

18. **BEGINNING PERSONNEL REPLACEMENTS FOR DIVISIONS**
CODE = 'BEG RPCZ'
NUM,CODE,ICYCLE,(RPCZ(IC),IC=ILOW,IHIGH)
FORMAT(I3, 'BEG RPCZ',I3,6X,4E13.7)

RPCZ(IC) = REPLACEMENT POOL FOR DIVISIONS IN COUNTRY IC.
IC RANGES OVER THOSE FOR SIDE L=1

19. **DIVISION DATA**
CODE = 'DIV DATA'
ONE RECORD FOR EACH DIVISION ON SIDE L=1:
NUM,CODE,ICYCLE,IS,ID,IC,IT,IBA,JBA,PDIV(ID),TDIV(ID),JCHIPP(ID), (NSUTD(ISU),ISU=1,NSU(1))
FORMAT(I3,'DIV DATA',I3,I1,5X,I3,2I2,I3,I2,2E13.7,I2,7F5.1)

ID = DIVISION ID
IC = DIVISION COUNTRY
IT = DIVISION TYPE
IBA = DIVISION BATTLE AREA
JBA = NUMBER OF BATTLE AREAS DIVISION IS LOCATED BEHIND ACTIVE BATTLE AREA
PDIV(ID) = DIVISION PERSONNEL
TDIV(ID) = DIVISION TRUCKS
JCHIPP(ID) = DIVISION DEFENSIVE POSTURE FOR PREVIOUS AND CURRENT CHEMICAL SUBCYCLES(PACKED)
NSUDT(ISU) = NUMBER OF SUBUNITS OF TYPE ISU IN DIVISION ID. (REAL VALUES.)

20. **DIVISION DISTRIBUTION**
CODE = 'DIV DIST'
ONE RECORD FOR EACH SECTOR:
NUM,CODE,ICYCLE,IS,IWORK1(IS),(STOR1(IC,IS,1),IC=ILOW,IHIGH)
FORMAT(I3,'DIV DIST',I3,I1,8X,I5,4E13.7)

IWORK1(IS) = NUMBER OF DIVISIONS IN THE SECTOR
STOR1(IC,IS,1) = FRACTION OF DIVISION PEOPLE IN SECTOR IS WHICH BELONG TO COUNTRY IC, WHERE IC RANGES OVER ALL BLUE COUNTRIES

21. **NON COMBAT PERSONNEL**
CODE = 'NC PLE'
ONE RECORD FOR EACH SECTOR:
NUM,CODE,ICYCLE,IS,SUMA,SUMNF,SUMNR,SUMN,SUMPTF,SUMPTR,SUMPT
FORMAT(I3,'NC PLE ',I3,I1,5X,7E13.7)

SUMA = SUM OF ALL PEOPLE AT AIRBASES IN SECTOR IS
SUMNF = SUM OF ALL PEOPLE AT SUPPLY NODES IN SF IN SECTOR IS
SUMNR = SUM OF ALL PEOPLE AT SUPPLY NODES IN SR IN SECTOR IS
SUMN = SUM OF ALL PEOPLE AT SUPPLY NODES IN CZ IN SECTOR IS
SUMPTF = SUM OF ALL PEOPLE AT PORTS IN SF IN SECTOR IS
SUMPTR = SUM OF ALL PEOPLE AT PORTS IN SR IN SECTOR IS
SUMPT = SUM OF ALL PEOPLE AT PORTS IN CZ IN SECTOR IS

22. **SSM PEOPLE**
CODE = 'SSM PLE'
ONE RECORD FOR EACH SECTOR:
NUM,CODE,ICYCLE,IS,(PMLSSM(ISSM,IS,1),ISSM=1,NSSM(1))
FORMAT(I3,'SSM PLE ',I3,I1,5X,7E13.7)

PMLSSM(ISSM,IS,1) = NUMBER OF SIDE BLUE PEOPLE AT SSM SITES OF TYPE ISSM IN SECTOR IS

23. **HIGHER ECHELON PEOPLE**
CODE = 'HE PLE'
ONE RECORD FOR EACH IFCT AND IS COMBINATION:
NUM,CODE,ICYCLE,IS,IFCT,SUMC,SUMT,EQPCU,EQPTA,ECACP(IFCT,IS,1), EAACP(IFCT,IS,1)
FORMAT(I3,'HE PLE ',I3,I1,5X,I2,6E13.7)

IFCT = FUNCTION
SUMC = NUMBER OF SIDE BLUE CORPS UNIT PEOPLE PERFORMING FUNCTION IFC IN SECTOR IS
SUMT = NUMBER OF SIDE BLUE THEATER ARMY PEOPLE PERFORMING FUNCTION IFCT IN SECTOR IS
EQPCU = NUMBER OF PIECES OF EQUIPMENT FOR SIDE BLUE CORPS UNITS PERFORMING FUNCTION IFCT IN SECTOR IS
EQPTA = NUMBER OF PIECES OF EQUIPMENT FOR SIDE BLUE THEATER ARMY UNITS PERFORMING FUNCTION IFCT IN SECTOR IS
ECACP(IFCT,IS,1) = NUMBER OF CORPS UNITS IN SECTOR IS
EAACP(IFCT,IS,1) = NUMBER OF THEATER ARMY UNITS IN SECTOR IS

24. ENDING BLUE PERSONNEL REPLACEMENTS FOR ALL EXCEPT DIVISIONS

CODE = 'END REP'
NUM, CODE, ICYCLE, RPPAB(1),RPPSN(1),RPPSSM(1),RPPHE(1)
FORMAT(I3,'END REP ',I3,6X,4E13.7)

RPPAB(1) = REPLACEMENT POOL FOR AIRBASES
RPPSN(1) = REPLACEMENT POOL FOR SUPPLY NODES
RPPSSM(1) = REPLACEMENT POOL FOR SSM SITES
RPPHE(1) = REPLACEMENT POOL FOR HIGHER ECHELON UNITS

25. ENDING PERSONNEL REPLACEMENTS FOR DIVISIONS

CODE = 'END RPCZ'
NUM,CODE,ICYCLE,(RPCZ(IC),IC=ILOW,IHIGH)
FORMAT(I3,'END RPCZ',I3,6X,4E13.7)

RPCZ(IC) = REPLACEMENT POOL FOR DIVISIONS IN COUNTRY IC.
IC RANGES OVER THOSE FOR SIDE L=1

26. FEBA MOVEMENT

CODE = 'CFEBA'
NUM,CODE,ICYCLE,(CFEBA(IS),IS = 1,NS)
FORMAT(I3,'END RPCZ',I3,6X,8E13.7)

CFEBA(IS) = CHANGES IN FEBA IN SECTOR IS THIS CYCLE

27. DIVISION MOPP DISTRIBUTION

CODE = 'DIV MOPP'
NUM,CODE,ICYCLE,IS,IC,(SDMOPP(IS,IC,MOPP),MOPP=1,4)
FORMAT(I3,'DIV MOPP',I3,I1,4X,I1,4E13.7)

SDMOPP(IS,IC,MOPP) = NUMBER OF SIDE 1 DIVISIONS IN MOPP LEVELS 1 THROUGH 4 AT THE END OF THE CYCLE. IT IS ASSUMED THAT THE TACWAR CHEMICAL PROTECTION LEVELS MAP INTO THE MOPP LEVELS AS FOLLOWS:

1 - IGNORE
2 - 1
3 - IGNORE
4 - 2
5 - 3
6 - 4

ANNEX B

CHEMICAL POSTPROCESSOR CALCULATIONS

All output is for side Blue equipment, by sector and by country. Results are on a per day basis. Currently we are playing 3 Blue countries, 6 SSM sites, 14 higher echelon unit functions, and 3 supply types.

Definitions: Soldiers = divisions, higher echelon units and SSM sites
Troops = soldiers
People = supply nodes and ports
C,CS, and CSS companies = divisions, higher echelon units and SSM sites
Casualties = wounded plus dead, but all are removed from battle. (We use the TACWAR variable TCSU for casualties.)

For now, we do not consider people at airbases.

For now, we do not consider indirect hits.

We assume that the country distribution of higher echelon people, trucks, and equipment are the same as that for division people.

We assume that the number of vehicles an NBC decon company can decontaminate in one day is 192.

Table C-2 lists the chemical defense equipment items considered in this study. The pages that follow describe the calculations performed to compute the requirements for each of these items.

TABLE C-2

CHEMICAL DEFENSE EQUIPMENT: ITEMS LIST AND SYMBOLS

CDE ITEM	SYMBOL
Filter Element (M13A2)	Wv101
Filter Canister (M10A1)	Wv102
Skin Decon Kit (M258A1)	Wv103
Suit, Chem Protect, Overgarment	Wv104
Boots, Chem Protect	Wv105
Gloves, Chem Protect	Wv106
Hood (M5)	Wv107
Hood (M6A2)	Wv108
Hood (M7)	Wv109
Winterization Kit (M3)	Wv110
Winterization Kit (M4)	Wv112
Detector Paper, Chem Agt, (M9)	Wv113
Decon Apparatus (M11)	Wv114
Nitrogen Cylinder	Wv115
DS-2, 1-1/3 Qt Canister	Wv116
DS-2, 5 Gal Pail	Wv117
Decon Apparatus (M13)	Wv118
Brush (M13) DAP	Wv119
Container for M13	Wv120
NBC Marking Set	Wv121
Detector Kit, Chem Agt, (M256)	Wv122
Battery (B3517/U)	Wv123
Refill Kit (M229)	Wv124
Particulate Gas Filter Unit (M7A1)	Wv125
Particulate Gas Filter Unit (M8A3)	Wv126
Particulate Gas Filter Unit(M13A1).	Wv127
Filter Set, Gas & Particulate (M56/59)	Wv128
Filter, Gas (XM48)	Wv129
Test Kit, Water (M272)	Wv130
Autoinjector (MK-1)	Wv131
Pralidoxime Chloride Injector	Wv132
Diazepam	Wv133
Water for Deliberate Decontamination	Wv134

WV101 M132A FILTER ELEMENTS

ASSUMPTIONS:

1. Troop strength = soldiers
2. Use strength at the end of each day, i.e., even cycles, to get daily average.
3. Attack on soldiers.

INPUT VARIABLES:

FRDT17
FRCU17
FRTA17
FRSS17
ISSMCG
PSSMCY

DATA FROM TACWAR:

Record 5 - number of division people attacked by liquid chemicals and number of casualties, per attack
Record 12 - number of SSM people attacked by liquid chemicals and number of casualties, per attack
Record 14 - number of corps unit people attacked by liquid chemicals and number of casualties, per attack
Record 15 - number of theater army unit people attacked by liquid chemicals and number of casualties, per attack
Record 19 - division people and trucks
Record 20 - country distribution of division people
Record 22 - SSM people
Record 23 - corps and theater army people and equipment

CALCULATION:

1/30th of the average daily troop strength with M17 masks plus daily average number of troops with M17 masks attacked by blood agents.

WV102 M10A1 FILTER CANISTER

ASSUMPTIONS:

1. Troop strength = soldiers
2. Use stength at the end of each day, i.e., even cycles, to get daily average.

INPUT VARIABLES:

FRDT24
FRCU24
FRTA24
FRSS24
ISSMCG
NNBC
PSSMCY
FRDT25
FRCU25
FRTA25
FRSS25

WV102 M10A1 FILTER CANISTER (continued)

DATA FROM TACWAR:

Record 5 - number of division people attacked by liquid chemicals and number of casualties, per attack
Record 12 - number of SSM people attacked by liquid chemicals and number of casualties, per attack
Record 14 - number of corps unit people attacked by liquid chemicals and number of casualties, per attack
Record 15 - number of theater army unit people attacked by liquid chemicals and number of casualties, per attack
Record 19 - division people and trucks
Record 20 - country distribution of division people
Record 22 - SSM people
Record 23 - corps and theater army people and equipment

CALCULATION:

1/30th of (the average daily troop strength with M24 masks plus the average daily troop strength with M25 masks) plus daily average number of troops with M24 or M25 masks surviving attacks by blood agents.

WV103 M258A1 SKIN DECONTAMINATION KITS

ASSUMPTIONS:

1. Liquid = semi-persistent + liquid (IAGTP = 2 & 3)
2. Companies = soldiers
3. Use all cycles to get average

INPUT VARIABLES:

PSSMCY
ISSMCG

DATA FROM TACWAR:

Record 5 - number of division people attacked by liquid chemicals and number of casualties, per attack
Record 20 - country distribution of division people
Record 14 - number of corps unit people attacked by liquid chemicals and number of casualties, per attack
Record 15 - number of theater army unit people attacked by liquid chemicals and number of casualties, per attack
Record 12 - number of SSM people attacked by liquid chemicals and number of casualties, per attack

CALCULATION:

Daily average of the number of soldiers surviving liquid chemical attacks, i.e., the sum over all liquid attacks of the difference between thesoldiers attacked and those which were casualties, all divided by thenumber of days of battle.

WV104 CHEMICAL PROTECTIVE OVERGARMENTS

ASSUMPTIONS:

1. Troop strength = soldiers
2. Liquid = semi-persistent + liquid (IAGTP = 2 & 3)
3. Companies = soldiers

WV104 CHEMICAL PROTECTIVE OVERGARMENTS (continued)

INPUT VARIABLES:
ISSMCG
NNBC
NSLDR
PSSMCY

DATA FROM TACWAR:
Troop strength from WV101.
Survivors of attacks from WV103.

CALCULATION:
1/30th of the average daily troop strength plus daily average of the number of soldiers surviving liquid chemical attacks plus average number of soldiers in all NBC decon companies.

WV105 CHEMICAL PROTECTIVE BOOTS

ASSUMPTIONS:
1. Troop strength = soldiers
2. Liquid = semi-persistent + liquid (IAGTP = 2 & 3)
3. Companies = soldiers

INPUT VARIABLES:
ISSMCG
NNBC
NSLDR
PSSMCY

DATA FROM TACWAR:
Troop strength from WV101.
Survivors of attacks from WV103.

CALCULATION:
1/14th of the average daily troop strength plus daily average of the number of soldiers surviving liquid chemical attacks plus average number of soldiers in all NBC decon companies.

WV106 CHEMICAL PROTECTIVE GLOVES

ASSUMPTIONS:
1. Troop strength = soldiers
2. Liquid = semi-persistent + liquid (IAGTP = 2 & 3)
3. Companies = soldiers
4. 7 mil gloves are worn only by people in hospitals and keypunch operators. Assume we can ignore keypunch operators which are nominal, and that people in hospitals are not attacked.

INPUT VARIABLES:
ISSMCG
NNBC
NSLDR
PSSMCY
PTG25

WV106 CHEMICAL PROTECTIVE GLOVES (continued)

DATA FROM TACWAR:

Troop strength and people in hospitals from WV101.
Survivors of attacks from WV103.

CALCULATION:

25 mil gloves - fraction of troops wearing these gloves * WV105
14 mil gloves - (1.-fraction of troops wearing 25 mil gloves)
* troop strength - average number of people in hospitals
7 mil gloves - average number of people in hospitals

WV107 M5 HOODS

ASSUMPTIONS:

1. Liquid = semi-persistent + liquid (IAGTP = 2 & 3)
2. Companies = soldiers

INPUT VARIABLES:

FRDT25
FRCU25
FRTA25
FRSS25
PSSMCY

DATA FROM TACWAR:

Record 5 - number of division people attacked by liquid chemicals and number of casualties, per attack
Record 20 - country distribution of division people
Record 14 - number of corps unit people attacked by liquid chemicals and number of casualties, per attack
Record 15 - number of theater army unit people attacked by liquid chemicals and number of casualties, per attack
Record 12 - number of SSM people attacked by liquid chemicals and number of casualties, per attack

CALCULATION:

Daily average of the number of soldiers wearing M25 masks who survive liquid chemical attacks, i.e., the sum over all liquid attacks of the difference between the soldiers attacked and those which were casualties times the percent of soldiers of that type which wear M25 masks , all divided by the number of days of battle.

WV108 M6A2 HOODS

ASSUMPTIONS:

1. Liquid = semi-persistent + liquid (IAGTP = 2 & 3)
2. Companies = soldiers

INPUT VARIABLES:

FRDT17
FRCU17
FRTA17
FRSS17
PSSMCY

WV108 M6A2 HOODS (continued)

DATA FROM TACWAR:

Record 5 - number of division people attacked by liquid chemicals and number of casualties, per attack

Record 20 - country distribution of division people

Record 14 - number of corps unit people attacked by liquid chemicals and number of casualties, per attack

Record 15 - number of theater army unit people attacked by liquid chemicals and number of casualties, per attack

Record 12 - number of SSM people attacked by liquid chemicals and number of casualties, per attack

CALCULATION:

Daily average of the number of soldiers wearing M17 masks who survive liquid chemical attacks, i.e., the sum over all liquid attacks of the difference between the soldiers attacked and those which were casualties times the percent of soldiers of that type which wear M17 masks , all divided by the number of days of battle.

WV109 M7 HOODS

ASSUMPTIONS:

1. Liquid = semi-persistent + liquid (IAGTP = 2 & 3)
2. Companies = soldiers

INPUT VARIABLES:

FRDT24
FRCU24
FRTA24
FRSS24
PSSMCY

DATA FROM TACWAR:

Record 5 - number of division people attacked by liquid chemicals and number of casualties, per attack

Record 20 - country distribution of division people

Record 14 - number of corps unit people attacked by liquid chemicals and number of casualties, per attack

Record 15 - number of theater army unit people attacked by liquid chemicals and number of casualties, per attack

Record 12 - number of SSM people attacked by liquid chemicals and number of casualties, per attack

CALCULATION:

Daily average of the number of soldiers wearing M24 masks who survive liquid chemical attacks, i.e., the sum over all liquid attacks of the difference between the soldiers attacked and those which were casualties times the percentof soldiers of that type which wear M24 masks , all divided by the number ofdays of battle.

WV110, WV111 M3 AND M4 WINTERIZATION KITS

Not consumable.

WV112 M8 CHEMICAL DETECTOR PAPER

ASSUMPTIONS:

1. companies = soldiers
2. Use all cycles to get averages
3. Calculation based on actual TACWAR soldiers & vehicles attacked, using 6 tickets per soldier and 6 per vehicle.
4. Number of vehicles calculated as function of number of people.
5. NBC decon company = NBC company

INPUT VARIABLES:

PDVVHL
PHEVHL
PSMVHL
PSSMCY
NNBC

DATA FROM TACWAR:

Record 5 - division people
Record 12 - SSM losses
Record 14 - corps losses
Record 15 - theater army losses
Record 20 - country distribution of division people

CALCULATION:

1/50th of average number of tickets used per day on soldiers and vehicles plus 1 book per vehicle decontaminated by each NBC decon company (i.e., 192 books per NBC company)

WV113 M9 CHEMICAL DETECTOR PAPER

ASSUMPTIONS:

1. theater strength = soldiers
2. overgarments (WV104) worn only by soldiers
3. equipment only in divisions, higher echelon units and SSM sites
4. attacks on C, CS, and CCS companies

INPUT VARIABLES:

SSMEQP
PSSMCY

DATA FROM TACWAR:

Record 8 - subunit trucks which contains data for equipment
Record 14 - corps losses
Record 15 - theater army losses
Record 20 - country distribution of division people
Record 12 - SSM losses
Record 19 - division equipment density (stored as trucks)
Record 23 - higher echelon equipment density
Record 22 - current SSM people

CALCULATION:

1/20th of average daily theater strength plus 0.15 * WV104 (overgarments) plus 1/28th of the average daily equipment density plus 0.14 of the average daily equipment attacked

WV114 M11 DECON APPARATUS

SEPARATE CALCULATION

WV115 NITROGEN CYLINDER & WV116 DS-2 1 1/3 QUART CAN

ASSUMPTIONS:

1. List A equipment attacked by persistent agent is averaged over the length of war. It is not calculated for the three time periods used in WV114.
2. Persistent = semi-persistent or liquid (IAGTP =2 & 3)
3. Use all cycles to get average
4. attacks only on C, CS, and CCS companies

INPUT VARIABLES:

FRDIVA
FRHEA
FRSSMA
PSSMCY
SSMEQP
NDAM11

DATA FROM TACWAR:

Record 8 - subunit trucks which contains data for equipment
Record 12 - SSM losses
Record 14 - corps losses
Record 15 - theater army losses
Record 20 - country distribution of division people

CALCULATION:

WV115 - 1.5 * 2 * average daily List A equipment attacked by persistent agent plus WV114
WV116 - 2 * average daily List A equipment attacked by persistent agent plus 2 * WV114

WV117 DS-2 5 GALLON PAILS

ASSUMPTIONS:

1. companies = TACWAR unit = division, corps, theater army, and SSM
2. Persistent = semi-persistent or liquid (IAGTP =2 & 3)
3. NBC decon company = NBC company
4. each decon company closes a site every two days

INPUT VARIABLES:

IDVM11
IHEM11
ISSM11
NNBC
SSMEQP
NDECON = number of decon platoons per NBC company

DATA FROM TACWAR:

Record 8 - subunit trucks which contains data for equipment
Record 14 - corps losses
Record 15 - theater army losses
Record 20 - country distribution of division people
Record 12 - SSM losses

WV117 DS-2 5 GALLON PAILS (continued)

CALCULATION:

2 * average daily units authorized M-11's attacked by persistent agent + 1 * average number of pieces of equipment attacked by persistent agent at units with M11 apparatus + 5 * .5 * NDECON * number of NBC companies

WV118 M13 DECON APPARATUS

SEPARATE CALCULATION

WV119 & WV120 M13 BRUSH AND CONTAINER

ASSUMPTIONS:

1. Persistent = semi-persistent or liquid (IAGTP =2 & 3)
2. attacks only on C, CS, and CCS companies

INPUT VARIABLES:

FRDIVA
FRHEA
FRSSMA
PSSMCY
SSMEQP

DATA FROM TACWAR:

Record 8 - subunit trucks which contains data for equipment
Record 12 - SSM losses
Record 14 - corps losses
Record 15 - theater army losses
Record 20 - country distribution of division people

CALCULATION:

0.25 * average daily List B equipment attacked by persistent agent

WV121 NBC MARKING SET

ASSUMPTIONS:

1. Persistent = semi-persistent or liquid (IAGTP =2 & 3)
2. Attacks on soldiers only.
3. Area of contamination is rectangle inside of rectangular area of the target.
4. Chemical platoon = decon platoon from NBC company

INPUT VARIABLES:

NNBC
NDECON = number of decon platoons in an NBC company

DATA FROM TACWAR:

Record 5 - number of persistent chemical attacks on divisions
Record 6 - length and width of contaminated areas for division subunits
Record 20 - country distribution of division people
Record 14 - number of persistent chemical attacks on corps units plus length and width of contaminated areas for corps units
Record 15 - number of persistent chemical attacks on theater army units plus length and width of contaminated areas for theater army units
Record 12 - number of persistent chemical attacks on SSM sites plus length and width of contaminated areas for SSM sites

WV121 NBC MARKING SET (continued)

CALCULATION:

The summation of:

1. 1.5 * average number of decon platoons (i.e. 1.5 * NDECON * number of NBC companies)
2. daily average of the perimeter of the area contaminated by persistent agent divided by 2000.

(Markers are placed every 100 meters with 20 markers per kit so that 1 kit is required every 2000 meters.)

WV122 M256 CHEMICAL AGENT DETECTOR KIT

ASSUMPTIONS:

1. 1 move = 15 kilometers of FEBA movement
2. Number of companies per brigade slice for sector and country = { SUM(subunits) + SUM(corps units) + SUM(theater army units) } divided by (3 * SUM(divisions)
3. Each NPB takes 15 minutes to 1 hour
   Each NPN takes 3 hours
   Each SPN takes 8 hours
4. Each PN and PX has max of 48 hours on their input durations
5. Attacks are only on divisions, corps units and theater army units, each with NPLT platoons.
6. NPB uses no unmasking procedures
7. The 5 agent types (NPB, NPN, SPN, PN and PX) do not overlap
8. Daily average number of companies per brigade slice can be distributed over combat, corps and theater army companies in proportion to the ratio of the number of each type which are in the brigade to the total number of all type companies in the brigade.

INPUT VARIABLES:

NRECON = number of recon squads per NBC company
AVGMOV
AGDUR
NPL

DATA FROM TACWAR:

Record 19 - number of divisions and subunits
Record 23 - number of corps and theater army units
Record 20 - country distribution of division people
Record 5 - number of each type of chemical attack on divisions
Record 14 - number of each type of chemical attack on corps units
Record 15 - number of each type of chemical attack on theater army units

CALCULATION:

1/12th of the summation of:

1. 4 * daily average of the number of companies of type I (combat, corps, theater army) per brigade slice * average number of moves per day
2. number of platoons in unit * [1 * daily average number of all attacks on units + 2 * daily average number of NPB attacks on units + 3 * daily average number of NPN attacks on units+ 8 * daily average number of SPN attacks on units + { daily average [number of PN attacks on units * MIN(duration of agent,average time for unit to move)] * 1/4} + { daily average [number of PX attacks on units * MIN(duration of agent,average time for unit to move)] * 1/4}]

WV122 M256 CHEMICAL AGENT DETECTOR KIT (continued)

3. 2 * number of platoons in a unit * daily average number of all attacks of all types except NPB
4. 42 * number of NBC recon squads (i.e., NRECON * number of NBC companies)

NOTE: If item 3 is combined with item 2, the first two lines of item 2 can be replaced by "3 * daily average number of all attacks on units".

WV123 through WV124

SEPARATE CALCULATIONS.

WV125 M12A1 AND M13 FILTERS FOR M7A1 FILTER UNITS

ASSUMPTIONS:

1. All hospitals are located in corps and theater army units of a specific function "hospital".
2. There is one hospital in each unit of type "hospital".
3. One filter unit is required per 100 hospital beds.

INPUT VARIABLES:

IHOSCU
IHOSTA
NBEDS

DATA FROM TACWAR:

Record 23 - number of corps and theater army units
Record 20 - country distribution of division people
Record 14 - number of each type of chemical attack on corps units
Record 15 - number of each type of chemical attack on theater army units

CALCULATION:

Summation of:

1. daily average number of NPB attacks on corps and theater army hospitals * NBEDS/100.
2. [daily average number of corps and theater army hospitals * (NBEDS/100)]/30 days.

WV126 M12A1 FILTERS FOR M8A3 FILTER UNITS

ASSUMPTIONS:

1. attacks on divisions and higher echelon units

INPUT VARIABLES:

SUBEQP
CUEQP
TAEQP

DATA FROM TACWAR:

Record 19 - number of subunits of each type ISU=1,NSU in each existing division
Record 23 - number of corps and theater army units
Record 20 - country distribution of division people
Record 5 - number of each type of chemical attack on division subunits
Record 14 - number of each type of chemical attack on corps units
Record 15 - number of each type of chemical attack on theater army units

WV126 M12A1 FILTERS FOR M8A3 FILTER UNITS (continued)

CALCULATION:

Summation over all equipment types I=1-5 (where 1= M551 AAV, 2= M60 AVLB, 3= M132 FTC, 4= M578RECV, 5= M88 RECV) of:

1. sum over all subunit types of [number of pieces of equipment of type I per subunit * daily average number of NPB attacks on subunits]
2. sum over all corps unit types of [number of pieces of equipment of type I per subunit *daily average number of NPB attacks on corps units]
3. sum over all theater army unit types of [number of pieces of equipment of type I per subunit * daily average number of NPB attacks on theater army units]
4. daily average number of pieces of equipment of type I per subunit divided by 30 days
5. daily average number of pieces of equipment of type I per corps unit divided by 30 days
6. daily average number of pieces of equipment of type I per theater army unit divided by 30 days

WV127 M18 FILTERS FOR M13A1 FILTER UNITS

ASSUMPTIONS:

1. attacks on divisions and higher echelon units

INPUT VARIABLES:

SUBEQP
CUEQP
TAEQP

DATA FROM TACWAR:

Record 19 - number of subunits of each type ISU=1,NSU in each existing division
Record 23 - number of corps and theater army units
Record 20 - country distribution of division people
Record 5 - number of each type of chemical attack on division subunits
Record 14 - number of each type of chemical attack on corps units
Record 15 - number of each type of chemical attack on theater army units

CALCULATION:

Summation over all equipment types I=6&7 (where 6= M728 CEV, 7= M60 TANK) of:

1. sum over all subunit types of [number of pieces of equipment of type I per subunit *daily average number of NPB attacks on subunits]
2. sum over all corps unit types of [number of pieces of equipment of type I per subunit daily average number of NPB attacks on corps units]
3. sum over all theater army unit types of [number of pieces of equipment of type I per subunit * daily average number of NPB attacks on theater army units]
4. daily average number of pieces of equipment of type I per subunit divided by 30 days
5. daily average number of pieces of equipment of type I per corps unit divided by 30 days
6. daily average number of pieces of equipment of type I per theater army unit divided by 30 days

WV128 M56/M59 FILTERS FOR M56/M59 FILTER UNITS

ASSUMPTIONS:

1. attacks on divisions and higher echelon units

WV128 M56/M59 FILTERS FOR M56/M59 FILTER UNITS (continued)

INPUT VARIABLES:

SUBEQP
CUEQP
TAEQP

DATA FROM TACWAR:

Record 19 - number of subunits of each type ISU=1,NSU in each existing division
Record 23 - number of corps and theater army units
Record 20 - country distribution of division people
Record 5 - number of each type of chemical attack on division subunits
Record 14 - number of each type of chemical attack on corps units
Record 15 - number of each type of chemical attack on theater army units

CALCULATION:

Summation over all equipment types I=8&9 (where 8= AN/TSQ73, 9= PATRIOT) of:

1. sum over all subunit types of [number of pieces of equipment of type I per subunit *daily average number of NPB attacks on subunits]
2. sum over all corps unit types of [number of pieces of equipment of type I per subunit daily average number of NPB attacks on corps units]
3. sum over all theater army unit types of [number of pieces of equipment of type I per subunit * daily average number of NPB attacks on theater army units]
4. daily average number of pieces of equipment of type I per subunit divided by 30 days
5. daily average number of pieces of equipment of type I per corps unit divided by 30 days
6. daily average number of pieces of equipment of type I per theater army unit divided by 30 days

WV129 M48 GAS FILTER

ASSUMPTIONS:

1. attacks on divisions and higher echelon units

INPUT VARIABLES:

CMEQP
DSGSR

DATA FROM TACWAR:

Record 19 - number of subunits of each type ISU=1,NSU in each division
Record 5 - number of chemical attacks of type NPN and of NPB on each of the subunit types ISU=1,NSU

CALCULATION:

Summation of:

1. sum over all subunit types of (number of M1 tanks per subunit * [daily average number of NPN attacks on subunits/10 + daily average number of NPB attacks on subunits/6])
2. sum over all subunit types of (number of Bradley IFVs per subunit * [daily average number of NPN attacks on subunits/10 + daily average number of NPB attacks on subunits/6])
3. sum over all subunit types of (number of M237 Sgt Yorks per subunit * [daily average number of NPN attacks on subunits/10 + daily average number of NPB attacks on subunits/6])
4. daily average number of M1 tanks divided by the DS/GS maintenance rate for M1 tanks
5. daily average number of Bradley IFVs divided by the DS/GS maintenance rate for Bradley IFVs
6. daily average number M247 Sgt Yorks divided by the DS/GS maintenance rate for M247 Sgt Yorks

WV130 M272 WATER TEST KIT

ASSUMPTIONS:

1. 1 movement = 15 km of FEBA movement.
2. 1 water point team per water point.
3. 17 water points per division, with 5 in area of division, 6 in corps area, and 6 in theater army area.
4. Each recon squad performs 3 tests per day for NBC reconnaissance.
5. Each recon squad performs one test every 3 days for the decon site .
6. Each decon platoon works 16 hours per day for decontamination.
7. The country distribution of higher echelon units is the same as that for division people.
8. Units attacked are divisions, corps units, and theater army units.
9. TACWAR chemical protection categories map into MOPP levels as follows:
   - 1 - ignore
   - 2 - 1
   - 3 - ignore
   - 4 - 2
   - 5 - 3
   - 6 - 4

INPUT VARIABLES:

FPHECP
RATPWS
NRECON = number of recon squads per NBC company
NDECON = number of decon platoons per NBC company

DATA FROM TACWAR:

Record 19 - number of divisions for country IC in sector IS
Record 27 - number of divisions for country IC in sector IS in each MOPP level
Record 23 - number of corps units and number of theater army units
Record 20 - country distribution of division people, number of divisions in each sector during cycle
Record 5 - number of division people attacked
Record 14 - number of corps units and people attacked
Record 15 - number of theater army units and people attacked

CALCULATION:

1/25th of the summation of:

1. 5 water point teams per division * [daily average number of divisions in MOPP1 * 1 test plus daily average number of divisions in MOPP2 * 2 tests plusdaily average number of divisions in MOPP3 * 4 tests plus daily average number of divisions in MOPP4 * 24 tests]
2. 6 water point teams per division * (number divisions in sector / number of corps units in sector) * [daily average number of corps units in MOPP1 * 1 test plus daily average number of corps units in MOPP2 * 2 tests plus daily average number of corps units in MOPP3 * 4 tests plus daily average number of corps units in MOPP4 * 24 tests]
3. 6 water point teams per division * (number divisions in sector / number of theater army units in sector) * [daily average number of theater army units in MOPP1 * 1 test plus daily average number of theater army units in MOPP2 * 2 tests plus daily average number of theater army units in MOPP3 * 4 tests plus daily average number of theater army units in MOPP4 * 24 tests]
4. [2 / (personnel/water source ratio)] * daily average number of people attacked in all units
5. daily average number of 15 km moves in sector IS * daily average number of divisions in the sector * 17 tests per division (i.e., 1 test for each water point, each of which must move when the division moves. 5 tests for combat, and 6 each for corps and theater army)
6. 3 * number of NBC companies * number of recon squads per NBC company

WV130 M272 WATER TEST KIT (continued)

7. 1/3 * number of NBC companies * number of recon squads per NBC company
8. 16 * number of NBC companies * number of decon platoons per NBC company

NOTE: The average number of corps units in a MOPP level is calculated as the summation of:

1. the sum over all functions of the product of the average number of corps units attacked, the fraction of corps units in MOPP level if the unit was attacked, and the fraction of the units in country IC
2. the sum over all functions of the product of the daily average of the difference between the number of corps units in the sector and the number attacked in the sector, the fraction of corps units in MOPP level if unit was not attacked ,and the fraction of the units in country IC. The theater army units in a MOPP level is similarly calculated.

WV131 AUTO INJECTOR, MARK I

ASSUMPTIONS:

1. attacks on soldiers
2. TACWAR yields casualties (TCSU) and fatalities (TFSU). TCSU will be used to determine the number of severe casualties including fatalities. Then moderate casualties will be computed as a function of severe casualties.
3. Moderate nerve casualties which return to duty will be calculated as a fraction of the total number of moderate only nerve casualties.

INPUT VARIABLES:

FRMOD
FRCRTN
ICATGY

DATA FROM TACWAR:

Record 5 - number of division casualties from nerve agent attacks
Record 20 - country distribution of division people
Record 14 - number of corps unit casualties from nerve agent attacks
Record 15 - number of theater army unit casualties from nerve agent attacks
Record 12 - number of SSM casualties from nerve agent attacks

CALCULATION:

3 * daily average number of nerve agent casualties plus
3 * daily average number of moderate casualties which return to duty

WV132 PRALIDOXIME CHLORIDE INJECTOR

ASSUMPTIONS:

1. attacks on soldiers
2. TACWAR yields casualties (TCSU) and fatalities (TFSU). TCSU will be used to determine the number of severe casualties including fatalities. Then moderate casualties will be computed as a function of severe only casualties.

INPUT VARIABLES:

FRMOD
FRCRTN
ICATGY

DATA FROM TACWAR:

Record 5 - number of division casualties and fatalities from nerve agent attacks
Record 20 - country distribution of division people

WV132 PRALIDOXIME CHLORIDE INJECTOR (continued)

Record 14 - number of corps unit casualties and fatalities from nerve agent attacks
Record 15 - number of theater army unit casualties and fatalities from nerve agent attacks
Record 12 - number of SSM casualties and fatalities from nerve agent attacks

CALCULATION:
4 * daily average number of nerve agent casualties dead plus
4 * daily average number of severe nerve casualty survivors plus
2 * daily average number of moderate only nerve casualties

WV133 DIAZEPAM INJECTOR SYRINGE UNIT

ASSUMPTIONS:
1. attacks on soldiers
2. TACWAR yields casualties (TCSU) and fatalities (TFSU). TCSU will be used to determine the number of severe casualties including fatalities. Then moderate casualties will be computed as a function of severe only casualties.

INPUT VARIABLES:
FRMOD
FRCRTN
ICATGY

DATA FROM TACWAR:
Record 5 - number of division casualties and fatalities from nerve agent attacks
Record 20 - country distribution of division people
Record 14 - number of corps unit casualties and fatalities from nerve agent attacks
Record 15 - number of theater army unit casualties and fatalities from nerve agent attacks
Record 12 - number of SSM casualties and fatalities from nerve agent attacks

CALCULATION:
3 * daily average number of nerve agent casualties dead plus
1.5 * daily average number of severe nerve casualty survivors plus
* daily average number of moderate only nerve casualties

WV134 WATER CONSUMPTION FOR DELIBERATE DECON OPERATIONS

ASSUMPTIONS:
1. Decon platoons operate at maximum capacity.

INPUT VARIABLES:
AVGOPS
NDECON = number of decon platoons per NBC company
NNBC
WCPLT

DATA FROM TACWAR:
None

CALCULATION:
number of decon platoons per NBC company * number of NBC compan... * average number of decon operations per day per platoon * average water consumpt... for each platoon decon operation

ANNEX C

TACWAR CHEMICAL POSTPROCESSOR INPUT VARIABLES

AGDUR(KA) **(LNAGT)**
Average duration of agent of type KA if it is persistent nerve or persistent blister. (Value must be <= 48 hours.)

AVGMOV(I) **(3)**
Average number of hours before a unit of type I moves after an attack from persistent nerve or persistent blister type agents, where 1=subunits, 2= corps units and 3= theater army units. (Values must be <= 48 hours.)

AVGOPS
Average number of decon operations per decon platoon per day.

CUEQP(IFCT,I) **(LNFCT,9)**
Number of pieces of type I equipment for corps units performing function IFCT, where
I=1 - M551 armoured assault vehicle
I=2 - M60/M60A1 tank chassis bridge launcher
I=3 - M132/M132A1 flame thrower carrier
I=4 - M578 recovery vehicle
I=5 - M88 recovery vehicle
I=6 - M728 CEV
I=7 - M60 series tank
I=8 - AN/TSQ-73
I=9 - Guided missle system, Patriot

CMEQP(ISU,IT,I) **(LNSU,LNIDT,3)**
Number of pieces of type I equipment for subunit type ISU within divisions of type IT,where I is 1=M1 tank, 2=Bradley IFV, and 3=M247 Sgt York.

DSGSR(I) **(3)**
DSGS maintenance rate as the number of days in a maintenance period for type I equipment, where 1=M1 tank, 2=Bradley IFV, and 3=M247 Sgt York.

FPHECP(IFCT,IPP,I) **(LNFCT,LNPP,2)**
Fraction of personnel in side L=1 higher echelon units of type IFCT that are in type IPP chemical protection posture when the unit is in the state I, where I=1 means the unit has been hit with chemical attack this cycle, and I=2 means the unit has not been hit this cycle. Note: the I=1 values should probably be those for the TACWAR variable FPHECP with L=1. Also, IPP =1 & 3 do not map into the MOPP levels of the postprocessor so these values will not be used.

FRCRTN(KA) **(LNAGT)**
Fraction of moderate only nerve casualties from agent type KA which return to active duty.

FRCU17(IFCT,IC) **(LNFCT,LNCTY)**
Fraction of country IC people in corps units of type IFCT that have M17 masks.

FRCU24(IFCT,IC) **(LNFCT,LNCTY)**
Fraction of country IC people in corps units of type IFCT that have M24 masks.

FRCU25(IFCT,IC) **(LNFCT,LNCTY)**
Fraction of country IC people in corps units of type IFCT that have M25 masks.

FRDIVA(ISU,IT) **(LNSU,LNIDT)**
Fraction of equipment in type ISU subunits within divisions of type IT which are List A items. (Equipment for subunits is stored in TACWAR trucks variables for use by this postprocessor.)

FRDT17(IT) **(LNIDT)**
Fraction of people in divisions of type IT that have M17 masks.

FRDT24(IT) **(LNIDT)**
Fraction of people in divisions of type IT that have M24 masks.

FRDT25(IT) **(LNIDT)**
Fraction of people in divisions of type IT that have M25 masks.

FRHEA(IFCT) **(LNFCT)**
Fraction of type IFCT equipment which are List A items.

FRMOD(KA) **(LNAGT)**
Factor to determine moderate casualties from severe casualties by agents of type KA. (FRMOD*TCSU - TCSU = number with only moderate casualties.)

FRSS17(ISSM,IC) **(LNSSM,LNCTY)**
Fraction of country IC people at SSM sites of type ISSM that have M17 masks.

FRSS24(ISSM,IC) **(LNSSM,LNCTY)**
Fraction of country IC people at SSM sites of type ISSM that have M24 masks.

FRSS25(ISSM,IC) **(LNSSM,LNCTY)**
Fraction of country IC people at SSM sites of type ISSM that have M25 masks.

FRSSMA(ISSM) **(LNSSM)**
Fraction of type ISSM equipment which are List A items.

FRSU17(ISU,IT) **(LNSU,LNIDT)**
Fraction of people in type ISU subunits within divisions of type IT that have M17 masks.

FRSU24(ISU,IT) **(LNSU,LNIDT)**
Fraction of people in type ISU subunits within divisions of type IT that have M24 masks.

FRSU25(ISU,IT) **(LNSU,LNIDT)**
Fraction of people in type ISU subunits within divisions of type IT that have M25 masks.

FRTA17(IFCT,IC) **(LNFCT,LNCTY)**
Fraction of country IC people in theater army units of type IFCT that have M17 masks.

FRTA24(IFCT,IC) **(LNFCT,LNCTY)**
Fraction of country IC people in theater army units of type IFCT that have M24 masks.

FRTA25(IFCT,IC) **(LNFCT,LNCTY)**
Fraction of country IC people in theater army units of type IFCT that have M25 masks.

ICATGY(KA) **(LNAGT)**
Value to indicate category of agent KA. Values 1=NPB, 2=NPN, 3=SPN, 4=PN, 5=PX and 0 if none of the above.(We assume there are no other categories of nerve agent.)

IDVM11(ISU) **(LNSU)**
Value to indicate if subunit of type ISU has M11 decon apparatus. Value =1 if yes, =0 if no.

IHEM11(IFCT) **(LNFCT)**
Value to indicate if higher echelon unit of type IFCT has M11 decon apparatus. Value =1 if yes, =0 if no.

IHOSCU
Value to indicate the type IFCT corps units which have hospitals.

IHOSTA
Value to indicate the type IFCT theater army units which have hospitals.

IPRI
Parameter to elect to have list of input values printed out. Value =1 if yes, =0 if no.

ISSMCG(ISSM) **(LNSSM)**
Assignment of SSM people at type ISSM sites to one of three categories of troops:
1 = combat
2 = corps
3 = theater army.

ISSM11(ISSM) **(LNSSM)**
Value to indicate if SSM site of type ISSM has M11 decon apparatus. Value =1 if yes, =0 if no.

NBEDS
Average number of beds in a hospital.

NDAM11(I,J,K) **(2,3,3)**
Total number of decontamination apparatus used per day (2 cycles) by type K troops (K=1 combat, K=2 corps, K=3 theater army) for list I (1=A, 2=B) for period J (1=1-15 days, 2=16-45 days, 3=over 45 days). Decon appartaus is M11 for List A and M13 for List B.

NNBC(IS,IC,I) **(LNS,LNCTY,3)**
Average number of NBC companies for country IC in area I (I=1 combat, I=2 corps, I=3 theater army) in sector IS.

NPLT(I) **(3)**
Number of platoons per TACWAR unit of type I, 1=subunits, 2=corps units, and 3=theater army units.

NSLDR(I) **(3)**
Average number of soldiers per NBC decon company in area I, where I is defined as 1=combat, 2=corps, and 3=theater army.

PDVVHL(ISU,IT) **(LNSU,LNIDT)**
Average number of vehicles per person in a combat subunit of type ISU in division of type IT.

PHEVHL(IFCT) **(LNFCT)**
Average number of vehicles per person in a higher echelon unit of type IFCT.

PSMVHL(ISSM) **(LNSSM)**
Average number of vehicles per person on a SSM site of type ISSM. (Use .3 for all values now.)

PSSMCY(ISSM,IS,IC) **(LNSSM,LNS,LNCTY)**
Fraction of people in SSM sites of type ISSM in sector IS which belongs to country IC.

PTG25(I) (3)

Fraction of troops of type I which wears gloves of thickness 25 mil, where I=1 combat,=2 corps, and =3 theater army.

RATPWS(IS) (LNS)

Number of personnel per water source in sector IS.

SSMEQP(ISSM) (LNSSM)

Number of pieces of equipment per person at SSM sites of type ISSM.

SUBEQP(ISU,IT,I) (LNSU,LNIDT,9)

Number of pieces of type I equipment for subunit type ISU within divisions of type IT,where

- I=1 - M551 armoured assault vehicle
- I=2 - M60/M60A1 tank chassis bridge launcher
- I=3 - M132/M132A1 flame thrower carrier
- I=4 - M578 recovery vehicle
- I=5 - M88 recovery vehicle
- I=6 - M728 CEV
- I=7 - M60 series tank
- I=8 - AN/TSQ-73
- I=9 - Guided missle system, Patriot

TAEQP(IFCT,I) (LNFCT,9)

Number of pieces of type I equipment for theater army units performing function IFCT, where

- I=1 - M551 armoured assault vehicle
- I=2 - M60/M60A1 tank chassis bridge launcher
- I=3 - M132/M132A1 flame thrower carrier
- I=4 - M578 recovery vehicle
- I=5 - M88 recovery vehicle
- I=6 - M728 CEV
- I=7 - M60 series tank
- I=8 - AN/TSQ-73
- I=9 - Guided missle system, Patriot

TITLE(I) (5)

Title of the postprocessor run in 5 four-character words. The value for this variable is input to the postprocessor in 5A4 format on the first line of the input file; it is not entered using the TACWAR format. The title allows the user to identify the postprocessor data set used in making these calculations. **IT MUST ALWAYS BE THE FIRST LINE OF THE INPUT FILE!!!**

WCPLT(I) (3)

Water consumption (in gallons) in area I (1=combat, 2=corps, 3=theater army) for each decon platoon operation.

Proposed Distribution List
IDA Paper P-1851, Volume II: Appendices A, B, and C, Documentation
Analysis of Wartime Consumption Rates For Chemical Defensive Equipment

Addressee	No. of Copies
DEPARTMENT OF DEFENSE	
Assistant Secretary of Defense for Acquisition and Logistics Room 3E813, Pentagon Washington, DC 20301	
ATTN: Mr. Royce Kneece	1
Office of the Secretary of Defense (OUSDRE) DOD-IDA Management Office 1801 North Beauregard Street Alexandria, VA 22311	
ATTN: John P. Wilhelm, Director	1
Defense Technical Information Center Cameron Station Alexandria, VA 22314	2
DEPARTMENT OF THE ARMY	
Commander U.S. Army Chemical School Ft. McClellan, AL 36202	
ATTN: ATZN-CM-CC	1
Commander U.S. Army Armament, Munitions and Chemical Command Rock Island, IL 61201	
ATTN: Mr. Terry Burke, DRSMC-NMD-L(R)	1
Commander U.S. Army Quartermaster Center and School Fort Lee, VA 23801	
ATTN: Mr. William Graves, ATSM-CD	1
Commander U. S. Army Training & Doctrine Command Fort Monroe, VA 23651	
ATTN: ATCD-NC/ATCD-AS	2

Commander
U.S. Army Material Command
5001 Eisenhower Avenue
Alexandria, VA 22333-0001

ATTN: LTC Robert Stoker 1

Director
U.S. Army Nuclear & Chemical Agency
7500 Backlick Road, Bldg. 2073
Springfield, VA 22150-3198

ATTN: MONA-CM 1

Commander
U.S. Army Support Activity, Philadelphia
2800 South 20th Street
Philadelphia, PA 19101

ATTN: Mr. Charles Becht, STSAP-M 1

Commander
U.S. Army Combined Arms Center
and Fort Leavenworth
Fort Leavenworth, KS 66027

ATTN: ATZL-CAM-IM 1

Department of the Army
Deputy Chief of Staff for Logistics
Room 3D572, The Pentagon
Washington, DC 20310

ATTN: DALO-SMA, DALO-SMW 2

Deputy Chief of Staff for Operations and Plans
Department of the Army
Room 3C542, The Pentagon
Washington, DC 20310-04403

ATTN: DAMO-NCC 1

Office of the Surgeon General
The Pentagon
Washington, DC 20310

ATTN: DASG-HCL-P 1

Commandant
Academy of Health Sciences
Fort Sam Houston, TX 78234

ATTN: Dr. Mosebar, HSHA-DCD 1

Commander U. S. Army Concepts and Analysis Agency 8120 Woodmont Avenue Bethesda, MD 20814	
ATTN: Dr. Robert Helmbold, CSCA-FOB Director U.S. Army Material Systems Analysis Activity Aberdeen Proving Ground, MD 21005	1
ATTN: Mr. John Rakaczky, DRXSY-CA	1
CDR U.S. Army Logistics Center Ft. Lee, VA 23801 ATTN: ATCL-OPF/CTF	2
INDUSTRIAL ORGANIZATIONS	
Institute for Defense Analyses 1801 North Beauregard Street Alexandria, VA 22311	25
ATTN: Gen. William Y. Smith Mr. Seymour J. Deitchman Mr. Robert B. Pirie, Jr. Dr. William J. Schultis Mr. Andre R. Barbeau Dr. David L. Randall Dr. Robert E. Roberts Dr. Stephen Baiut Mr. Edward P. Kerlin Mr. Willard M. Christenson Mr. D. Graham McBryde Miss Eileen M. Doherty IDA C&D (12 COPIES) Mrs. K. Weber	
TOTAL COPIES	47

END

12-86

DTIC